

FINAL REPORT
JUNE 1995

REPORT NO. 95-04

ISO-COMPATIBLE PALLETIZED
FLATRACK (IPF)
TRANSPORTABILITY TESTING

19960129093

Prepared for:
U.S. Army Tank-automotive and
Armaments Command
ATTN: SFAE-TWV-PLS
Warren, MI 48397-5000

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SAVANNA, ILLINOIS 61074-9639

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<p>The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SIOAC-DEV), was tasked by the U.S. Army Tank-automotive and Armaments Command (TACOM) to test the ISO-Compatible Palletized Flatrack (IPF) on the Palletized Loading System (PLS) with ammunition loads for compliance with Transportability Testing Procedures, TP-94-01, July 1994. Testing included the IPF loaded onto the following: Container-on-flatcar (COFC), Trailer-on-flatcar (TOFC), PLS truck cabled on a standard flatcar, PLS trailer cabled on a standard flatcar, PLS truck and PLS trailer over road hazard course, including road trip, washboard, and Shipboard Transportation Simulator (STS) with four different ammunition loads. Additional rail impact tests included 3- and 5-high IPF retrograde transportation on COFC and on a container chassis on a TOFC. The results of the tests are contained in this report.</p>					
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REPORT NO. 95-04

ISO-COMPATIBLE PALLETIZED FLATRACK (IPF) TRANSPORTABILITY TESTING

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PART 1

INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SIOAC-DEV), was tasked by the U.S. Army Tank-automotive and Armaments Command (TACOM) to test the ISO-Compatible Palletized Flatrack (IPF) on the Palletized Loading System (PLS) truck and the PLS trailer with ammunition loads for compliance with Transportability Testing Procedures, TP-94-01, July 1994.

B. AUTHORITY. These tests were conducted IAW mission responsibilities delegated by U.S. Army Armament, Munitions and Chemical Command, Rock Island, IL 61299-5000. Reference is made to Change 4, 4 October 1974, to AR 740-1, 23 April 1971, Storage and Supply Operations; AMCCOMR 10-17, 13 January 1986, Mission and Major Functions of USADACS.

C. OBJECTIVE. The objective of these tests was to validate the design criteria of the IPF for the transportation of ammunition and retrograde configurations in all modes of transportation. Rail impact tests were conducted with various types of ammunition loaded on the IPF transported on a Container-on-flatcar (COFC), Trailer-on-flatcar (TOFC), PLS truck on standard flatcar, and PLS trailer on standard flatcar. Test loads on the IPF also traversed the road hazard course and were subjected to the Shipboard Transportation Simulator (STS).

D. CONCLUSIONS. Several failures occurred during testing of the IPF between 15 May and 22 June 1995. They are as follows:

1. While transporting the IPF in a retrograde configuration of five high, the twist locks used to interlock one IPF to the IPF above failed.

2. While normally handling the IPF with a 10,000-pound rough terrain forklift, the IPF slid on the forklift tines and the forklift tine end punched a hole in the IPF deck and bent one IPF crossmember.

3. During transportation testing of the loaded IPF, it was observed that the tops of the end walls were spreading outward. This was verified when a standard 20-foot container handler could not mate with the upper International Organization for Standardization (ISO) corner fittings at the opposite end of the IPF. The distances measured were slightly in excess of 242 inches between the corner fittings on opposite end walls. The maximum ISO overall external dimension is 238-7/8 inches. Close scrutiny of one IPF showed that the pivot, locking, and A-frame pins were permanently deformed.

4. The IPF end wall is covered with corrugated sheet metal instead of a wooden deck. The narrow part of the corrugations are oriented toward the load side end wall. The width of the corrugation is approximately one inch extending from the floor to the top. This narrow surface presents a high stress concentration to the load, offering damage to the load or flattening of the corrugation. Flattened corrugations were observed after rail transportation tests.

5. The end wall pivot pin mounting assemblies are bolted to the IPF from the load side of the end wall. These bolt heads protrude above the planes of the end wall corrugations and damage loaded cargo.

E. RECOMMENDATIONS. As of 23 June 1995, recommendations are as follows:

1. Twist locks were remounted and butt plates added to restrict lateral movement of the IPF during retrograde transportation. Functionality and effectiveness of this production modification will be tested at a later date.

2. Add a forklift tine tunnel to prevent the forklift tines from making direct contact with the deck underside, resulting in deck damage.

3. Modify the IPF end wall design to transmit rotational loading to the center and side rails. The current design supports all end wall loading on four or six pins. These pins are not strong enough and yield from rotational loading experienced in rail transportation. The rotational and locking pins should be fabricated from a stronger material.

4. Replace the corrugated IPF end wall with a smooth flat surface to reduce high stress concentrations which can damage the load and the end wall. Extend the smooth flat surface thickness sufficiently to match the height of the end wall pivot pin assembly bolts.

PART 2

15 MAY - 21 JUNE 1995

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PART 3

TEST PROCEDURES

A. Test procedures were extracted from Transportability Testing Procedures, TP-94-01, July 1994, for validating tactical vehicles and outloading procedures used for shipping munitions by intermodal freight containers, commercial or tactical truck, trailer, or railcar.

B. The test loads were prepared using the same blocking and bracing methods specified in the tiedown procedures proposed for use with munitions (see Part 6). The IPFs used in these tests were inspected to ensure their adequacy for munitions transport. Items used to build the load were inert (nonexplosive). The weight and physical characteristics of the load configuration were identical to the live (explosive) ammunition provided for in the tiedown procedure; i.e., weights, physical dimensions, center of gravity (CG), materials, etc. The ammunition packages duplicated that of live ammunition.

C. Tests conducted for this set of load configurations are as follows:

1. Rail Impact - COFC (Test Method No. 1).
2. Rail Impact - TOFC (Test Method No. 1).
3. Rail Impact - PLS Trailer on flatcar (Test Method No. 1).
4. Rail Impact - PLS Truck on flatcar (Test Method No. 1).
5. Hazard Course - PLS Truck and Trailer (Test Method No. 2).
6. Road Trip - PLS Truck and Trailer (Test Method No. 3).
7. Hazard Course - PLS Truck and Trailer (Test Method No. 2).
8. Washboard Course - PLS Truck and Trailer (Test Method No. 6).

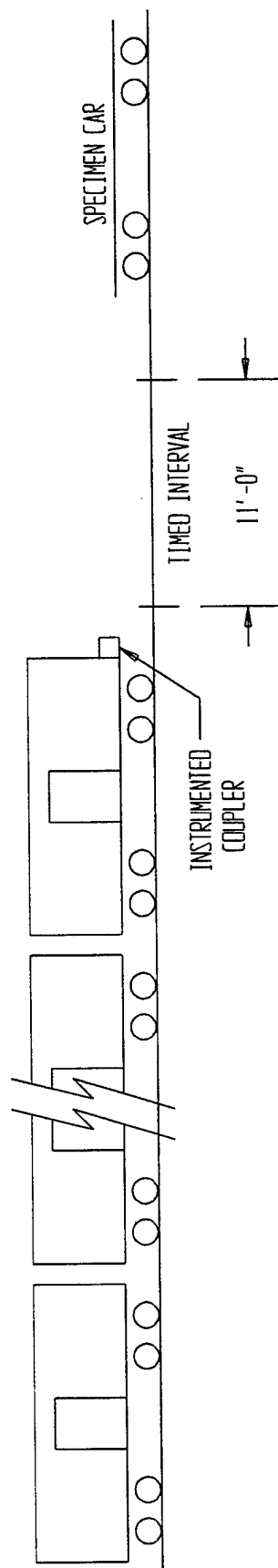
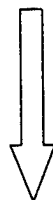
D. The test methods are as follows:

1. Test Method No. 1 (Rail Impact Test). The loaded IPF was tested on a COFC, a container chassis secured to a stanchion on a TOFC, the PLS trailer secured to a flatcar, and the PLS truck secured to a flatcar. Equipment needed to perform the test included the specimen (hammer) car, five empty railroad cars connected together to serve as an anvil, and a railroad locomotive. These anvil cars were positioned on a level section of track with air and hand brakes set and with the draft gears compressed. The locomotive unit pulled the specimen car several hundred yards away from the anvil cars, pushed the specimen car toward the anvil at a predetermined speed, then disconnected from the specimen car approximately 50 yards away from the anvil cars which allowed the specimen car to roll freely along the track until it struck the anvil. This constituted an impact. Impacting was accomplished at speeds of 4, 6, and 8.1 mph and at a speed of 8.1 mph in reverse. The 4 mph and 6 mph impact speeds were approximate; the 8.1 mph speed was minimum. Impact speeds were determined by using an electronic counter to measure the time for the specimen car to traverse an 11-foot distance immediately prior to contact with the anvil cars (see Figure 1).

2. Test Method No. 2 - (Hazard Course). This step required the loaded IPF to be transported over the 200-foot-long segment of concrete-paved road which consists of two series of railroad ties projecting 6-inches above the level of the road surface. The loaded IPF traversed this course two times.

3. Test Method No. 3 - (Road Trip). The loaded IPF was transported for a distance of 30 miles over a combination of roads surfaced with gravel, concrete, or asphalt. The test route included curves, corners, railroad crossings, cattle guards, and stops and starts. The IPF traveled at the maximum speed for the particular road being traversed, except as limited by legal restrictions. Upon completion of the 30-mile road trip, the loaded IPF was subjected to three full

ASSOCIATION OF AMERICAN RAILROADS (AAR) STANDARD TEST PLAN



5 BUFFER CARS (ANVIL) WITH DRAFT GEAR
COMPRESSED AND AIR BRAKES IN A SET
POSITION

ANVIL CARS TOTAL WT 250,000 LBS (APPROX)

SPECIMEN CAR
IS RELEASED BY
SWITCH ENGINE TO

ATTAIN: IMPACT NO. 1 @ 4 MPH
IMPACT NO. 2 @ 6 MPH
IMPACT NO. 3 @ 8.1 MPH

THEN THE CAR IS REVERSED AND
RELEASED BY SWITCH ENGINE TO

ATTAIN: IMPACT NO 4. @ 8.1 MPH

FIGURE 1

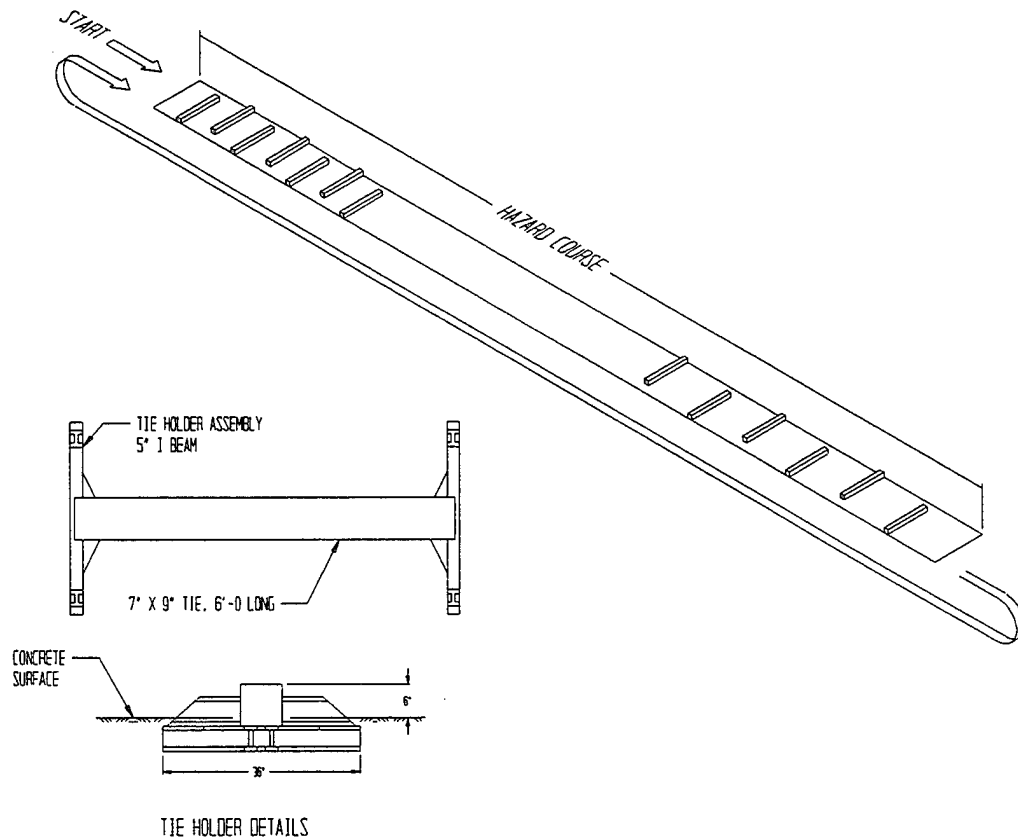


FIGURE 2

airbrake stops while traveling in the forward direction and one in the reverse direction. The first three stops were at 5, 10, and 15 mph, while the stop in the reverse direction was approximately 5 mph.

4. Test Method No. 4 - (Shipboard Transportation Simulator) (STS). The IPF was positioned onto the STS and securely locked in place using the cam lock at each ISO corner fitting. The STS began oscillating at an angle of 30 degrees, plus or minus 2 degrees, either side of vertical at a frequency of 2 cycles-per-minute (cpm) (30 seconds plus or minus 2 seconds total roll period). This frequency was observed for apparent defects that could cause a safety hazard. The frequency of oscillation was increased to 4 cpm (15 seconds plus or minus one second roll period) and the apparatus operated for 2 hours. If inspection of the load does not indicate an impending failure, the frequency of oscillation is increased to 5 cpm (12 seconds plus or minus

one second-cycle-time), and the apparatus operated for 4 hours. The operation does not have to be continuous; however, no change or adjustments to the load or load restraints was permitted at any time during the test. After being set in place, the IPF was not removed from the STS until the test was completed.

5. Test Method No. 6 - (Washboard Course). The IPF was driven over the washboard course (Figure 3) at a speed which produced the most violent response in the IPF. The washboard course is constructed as shown in Figure 3.

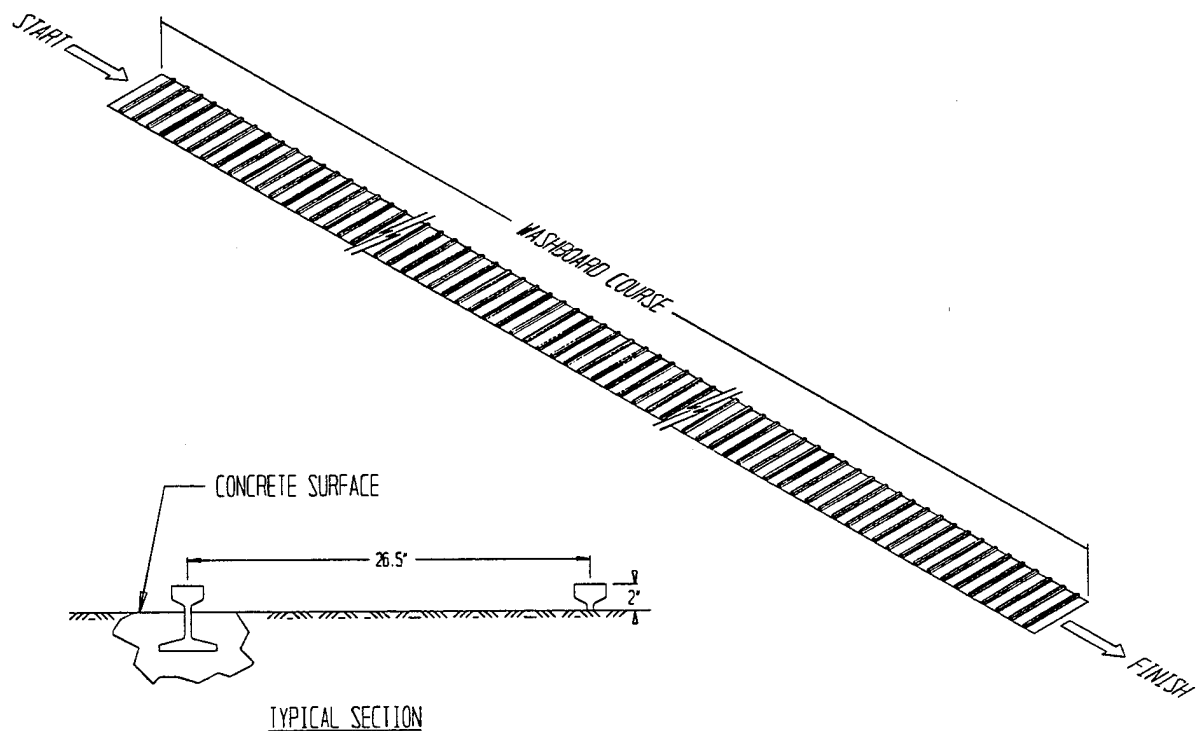


FIGURE 3

PART 4

TEST RESULTS

RAIL IMPACT DATA

TEST NO. 1

DATE: 15 May 1995

SPECIMEN LOAD: PLS IPF - Five-High Retrograde on COFC

COFC NO.: TTWX 97926	LT. WT.: 80,500 pounds
IPF NO.: USAU0100208	WT.: 7,100 pounds
IPF NO.: USAU0100147	WT.: 7,100 pounds
IPF NO.: USAU0100189	WT.: 7,100 pounds
IPF NO.: USAU0100255	WT.: 7,100 pounds
EPF No.: 1	WT.: 8,500 pounds

TOTAL SPECIMEN WT.: 117,400 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT NO.</u>	<u>END STRUCK</u>	<u>VELOCITY (MPH)</u>	<u>REMARKS</u>
1	Front	5.20	Flatracks shifted on ISO fitting tolerances.
2	Front	6.84	Flatracks shifted on ISO fitting tolerances.
3	Front	8.14	Tolerances limited stair step shift.
4	Rear	9.35	Tolerance shift reversed. No visual damage to retrograde IPF units.

Notes:

1. There are no accessible female ISO fittings for top lifting a retrograde stack of IPFs.
2. Loading can be accomplished by raising the top end walls to access the ISO blocks. The end walls must be lowered and secured with web straps prior to testing or shipment.

3. Male ISO mounting bars, approximately 1/2-inch-thick by 3/4-inch-wide, deform when loading one IPF on top of another. To engage the ISO locks, they must be pried back into the proper locking position.

RAIL IMPACT DATA

TEST NO. 2

DATE: 15 May 1995

SPECIMEN LOAD: PLS IPF - Five-High Retrograde on TOFC

COFC No.: TTX 600585	Lt. Wt.: 72,500 pounds
IPF No.: USAU0100208	Wt.: 7,100 pounds
IPF No.: USAU0100147	Wt.: 7,100 pounds
IPF No.: USAU0100189	Wt.: 7,100 pounds
IPF No.: USAU0100255	Wt.: 7,100 pounds
EPF No.: 1	Wt.: 8,500 pounds
Chassis Trailer No.: 5394	Wt.: 6,500 pounds

TOTAL SPECIMEN WT.: 115,900 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	<u>VELOCITY</u> <u>(MPH)</u>	<u>REMARKS</u>
1	Front	4.95	Flatracks shifted on tolerance.
2	Front	7.00	Flatracks shifted on ISO fitting tolerances.
3	Front	8.78	Tolerances limited stair step shift.
4	Rear	8.68	Tolerance shift reversed. All ISO flip mounts sheared from flatracks sliding within tolerance ranges.

Notes:

1. Male ISO mounting bars, approximately 1/2-inch-thick by 3/4-inch-wide, deform when loading one IPF on top of another. To engage the ISO locks, they must be pried back into the proper locking position.

2. Due to shearing of ISO fittings on four IPFs, the IPF cannot be shipped in retrograde configuration.

Meeting with OTC at USADACS - 17 May 1995

Visitors: Messrs. Dan Brad and John Morrow
Oshkosh Truck Corporation
Oshkosh, WI

Subject: Failure of Twist Locks on Production IPF

1. The twist locks failed on all but one of the production IPFs during rail impact testing on a friction draft gear TOFC. The twist lock separated from the pivot arm after taking the stress of the sliding interlocked flatracks above and below the interlocked positions. The test configuration consisted of five IPFs on a chassis trailer loaded onto a TOFC. Impacts were performed at 4.95, 7.00, and 8.78 mph in the reverse direction and at 8.68 mph in the forward direction. Following each impact, each flatrack shifted the 1-inch ISO tolerance so that they appeared stepped in the direction of impact. The twistlock hinge pin broke at the welds. The hinges - connecting the hinge pin to the twistlock - were stretched. Welds between the hinge and the twistlock were lacking in good penetration. A suggested fix is to allow the hinge arm to float about the hinge pin with enough space to accommodate the ISO tolerances. This takes the shear impact loads off of the hinge pin and arm and transfers them to the stop, plated in the corner posts.

2. One IPF wooden deck was punched through from the bottom with a forklift tine during pallet movement. This pointed out the fact that some of the wood used in fabricating the deck is of questionable quality. There should also be protection from forklift tines between the pallet deck and the forklift pockets.

3. No manuals were shipped with the IPF. The 3/4-inch ratchet bar provided with the flatrack can be used to seat the twist locks. A pinch bar, crow bar, and hammer were used to seat the twistlocks in preparation for testing.

4. Rail transportation on the PLS truck. The PLS load handling system could sustain damage from rail impacts due to the three-high retrograde load of IPFs due to the ISO interface tolerance. The lower IPF is pinned to the truck. The next two can slide approximately 3/4-inch each for a total of 1-1/2 inches. This movement could result in damage to the PLS hook arm in a rail transportation mode.

5. A bail bar is being prepared for shipment to USADACS for use in loading three-high IPFs on the PLS truck for retrograde. ISO-Compatible palletized flatracks must be bundled with load binders and chains at each end and have diagonal web straps on each side to maintain an envelope for loading on the PLS truck and interlocking.

6. Recommend putting vibration-proof nuts on the bolts holding the storage box doors shut. Most of the ones installed at the factory fell off before arriving at USADACS.

7. Recommend adding drain holes to the back of the storage boxes. They accumulate water when the end walls are in the stowed position.

RAIL IMPACT DATA

Test No. 3

Date: 8 June 1995

SPECIMEN LOAD: Four PLS IPFs on a COFC

COFC NO.: TTWX 97926	LT. WT.: 80,500 pounds
IPF NO.: USAU0100208	WT.: 7,100 pounds
155MM Separate Loading Projectiles (SLPs)	WT.: 31,140 pounds
IPF NO.: USAU0100147	WT.: 7,100 pounds
Boxed Ammo with high CG	WT.: 27,824 pounds
IPF NO.: USAU0100189	WT.: 7,100 pounds
120MM Metal Pallets	WT.: 25,500 pounds
IPF NO.: USAU0100255	WT.: 7,100 pounds
Multiple Launch Rocket System (MLRS)	WT.: 20,840 pounds

TOTAL SPECIMEN WT.: 193,364 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	<u>VELOCITY</u> <u>(MPH)</u>	<u>REMARKS</u>
1	Front	4.38	No load movement.
2	Front	6.68	No load movement.
3	Front	9.13	All loads intact, no IPF deformation.
4	Rear	8.56	No visual damage to loads of IPFs.

Notes:

1. The TTWX-type of railcar has a cushioned draft gear, thus, dampening (reducing) the amount of impact shock experienced by the flatracks and loads.

RAIL IMPACT DATA

Test No. 4

DATE: 8 June 1995

SPECIMEN LOAD: Two PLS IPFs on a Container Chassis on Flatcar

TOFC NO.: TTX 600585	LT. WT.: 80,500 pounds
CHASSIS NO.: 4268	WT.: 6,200 pounds
IPF NO.: USAU0100208	WT.: 7,100 pounds
155MM SLPs	WT.: 31,140 pounds
CHASSIS NO.: 5394	WT.: 6,200 pounds
IPF NO.: USAU0100189	WT.: 7,100 pounds
120MM Metal Pallets	WT.: 25,500 pounds

TOTAL SPECIMEN WT.: 163,740 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	<u>VELOCITY</u> <u>(MPH)</u>	<u>REMARKS</u>
1	Rear	4.49	No load movement.
2	Rear	6.36	1-inch gap at end of 120MM load.
3	Rear	9.04	No change in 1-inch gap at end of 120MM load.
4	Front	8.34	120MM load - 3-inch gap between load and plywood on front wall. Plywood sheared at 6 inches above the floor.

Notes:

1. The TTX-type of railcar has a friction draft gear and does not dampen (reduce) the amount of impact shock experienced by the flatracks and loads.

RAIL IMPACT DATA

TEST NO.: 5

DATE: 8 June 1995

TEST SPECIMEN: Two PLS IPFs on a Container Chassis on Flatcar

TOFC NO.: TTX 97926

LT. WT.: 80,500 pounds

IPF NO.: USAU0100147

WT.: 7,100 pounds

Boxed Ammo with high CG

WT.: 27,824 pounds

IPF NO.: USAU0100255

WT.: 7,100 pounds

Multiple Launch Rocket System (MLRS)

WT.: 20,840 pounds

TOTAL SPECIMEN WT.: 143,364 pounds

BUFFER CAR (FIVE CARS) WT. 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	<u>VELOCITY</u>	<u>REMARKS</u>
		<u>(MPH)</u>	
1	Front	4.41	No load movement.
2	Front	6.59	1/2-inch gap between rear end wall and boxed ammunition load.
3	Front	8.60	1-inch gap between rear end wall and boxed ammunition. Center gate 1/2-inch above pallet deck. MLRS pods were okay.
4	Rear	8.86	Box load repositioned. No visible damage to either load.

Notes:

1. The TTX-type of railcar has a friction draft gear producing a large amount of impact shock to the flatracks and loads.

ROAD TEST DATA

TEST NO.: 6

DATE: 12 June 1995

SPECIMEN LOAD: IPF with Multiple Launch Rocket System (MLRS) Pods

ROAD HAZARD COURSE:

PASS 1-A OVER FIRST SERIES OF TIES:	6.45 SEC	5.28 MPH
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PASS 1-B OVER SECOND SERIES OF TIES:	5.60 SEC	5.85 MPH
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REMARKS: MLRS pods moving laterally.

PASS 2-A OVER FIRST SERIES OF TIES:	5.72 SEC	5.96 MPH
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PASS 2-B OVER SECOND SERIES OF TIES:	6.18 SEC	5.29 MPH
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REMARKS: MLRS pods moving laterally.

30-MILE ROAD TEST: No damage or load movement.

PANIC STOP TEST: No panic stops were performed since this load was previously rail impact tested.

PASS 3-A OVER FIRST SERIES OF TIES:	6.41 SEC	5.32 MPH
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PASS 3-B OVER SECOND SERIES OF TIES:	6.24 SEC	5.24 MPH
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REMARKS: Pods moving laterally.

PASS 4-A OVER FIRST SERIES OF TIES:	6.31 SEC	5.40 MPH
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PASS 4-B OVER SECOND SERIES OF TIES:	5.62 SEC	5.82 MPH
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REMARKS: MLRS pods moved to the edge of the IPF. One pod separator moved outside of the ISO envelope.

WASHBOARD COURSE: No additional load movement.

ROAD TEST DATA

TEST NO.: 7

DATE: 12 June 1995

SPECIMEN LOAD: IPF with Metal Pallets of PA116 120MM Containers

ROAD HAZARD COURSE:

PASS 1-A OVER FIRST SERIES OF TIES:	5.93 SEC	5.75 MPH
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PASS 1-B OVER SECOND SERIES OF TIES:	6.23 SEC	5.26 MPH
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REMARKS: Pallets moved 1/2-inch laterally.

PASS 2-A OVER FIRST SERIES OF TIES:	5.70 SEC	5.99 MPH
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PASS 2-B OVER SECOND SERIES OF TIES:	6.26 SEC	5.23 MPH
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REMARKS: No lateral movement.

30-MILE ROAD TEST: No damage or load movement.

PANIC STOP TEST: No panic stops were performed since this load was previously rail impact tested.

PASS 3-A OVER FIRST SERIES OF TIES:	6.33 SEC	5.38 MPH
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PASS 3-B OVER SECOND SERIES OF TIES:	6.25 SEC	5.23 MPH
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REMARKS: No lateral movement.

PASS 4-A OVER FIRST SERIES OF TIES:	6.20 SEC	5.49 MPH
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PASS 4-B OVER SECOND SERIES OF TIES:	5.85 SEC	5.60 MPH
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REMARKS: No lateral movement.

WASHBOARD COURSE: No additional load movement.

ROAD TEST DATA

TEST NO.: 8

DATE: 12 June 1995

Specimen Loads: IPF with 155MM SLPs on an IPF

ROAD HAZARD COURSE:

PASS 1-A OVER FIRST SERIES OF TIES:	5.62 SEC	6.03 MPH
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PASS 1-B OVER SECOND SERIES OF TIES:	5.51 SEC	5.94 MPH
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REMARKS: No lateral movement.

PASS 2-A OVER FIRST SERIES OF TIES:	5.68 SEC	6.00 MPH
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PASS 2-B OVER SECOND SERIES OF TIES:	6.39 SEC	5.12 MPH
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REMARKS: No lateral movement.

30-MILE ROAD TEST: No damage or load movement.

PANIC STOP TEST: No panic stops were performed since this load was previously rail impact tested.

PASS 3-A OVER FIRST SERIES OF TIES:	6.34 SEC	5.37 MPH
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PASS 3-B OVER SECOND SERIES OF TIES:	5.64 SEC	5.79 MPH
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REMARKS: No lateral movement.

PASS 4-A OVER FIRST SERIES OF TIES:	5.67 SEC	6.01 MPH
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PASS 4-B OVER SECOND SERIES OF TIES	5.56 SEC	5.88 MPH
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REMARKS: No lateral movement.

WASHBOARD COURSE: No additional load movement. No apparent load damage.

ROAD TEST DATA

TEST NO.: 9

DATE: 12 June 1995

Specimen Loads: IPF with High CG Boxed Ammunition Load

ROAD HAZARD COURSE:

PASS 1-A OVER FIRST SERIES OF TIES:	5.62 SEC	6.07 MPH
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PASS 1-B OVER SECOND SERIES OF TIES:	6.48 SEC	5.05 MPH
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REMARKS: No lateral movement.

PASS 2-A OVER FIRST SERIES OF TIES:	6.10 SEC	5.59 MPH
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PASS 2-B OVER SECOND SERIES OF TIES:	5.84 SEC	5.61 MPH
--------------------------------------	----------	----------

REMARKS: No lateral movement.

30-MILE ROAD TEST: No damage or load movement.

PANIC STOP TEST: No panic stops were performed since this load was previously rail impact tested.

PASS 3-A OVER FIRST SERIES OF TIES:	5.61 SEC	6.09 MPH
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PASS 3-B OVER SECOND SERIES OF TIES:	6.36 SEC	5.15 MPH
--------------------------------------	----------	----------

REMARKS: No lateral movement.

PASS 4-A OVER FIRST SERIES OF TIES:	6.29 SEC	5.42 MPH
-------------------------------------	----------	----------

PASS 4-B OVER SECOND SERIES OF TIES:	6.23 SEC	5.26 MPH
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REMARKS: No lateral movement.

WASHBOARD COURSE: No additional load movement. No apparent load damage.

RAIL IMPACT DATA

TEST NO.: 10

DATE: 14 June 1995

SPECIMEN LOAD: IPF with 155MM SLPs on PLS Trailer on Flatcar

FLATCAR NO.: BN 615005

LT. WT.: 55,000 pounds

PLS Trailer SN 42879

WT.: 13,200 pounds

IPF NO.: USAU0100208

WT.: 7,100 pounds

155MM SLPs

Wt.: 31,140 pounds

TOTAL SPECIMEN WT.: 106,440 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	<u>VELOCITY</u> <u>(MPH)</u>	<u>REMARKS</u>
1	Forward	4.56	No load movement.
2	Forward	6.49	No load movement.
3	Forward	8.46	Rear cables on trailer broke. Recable and retest.

RAIL IMPACT DATA

TEST NO.: 11

DATE: 14 June 1995

SPECIMEN LOAD: IPF with 120MM Metal Pallets on PLS Truck on Flatcar

FLATCAR NO.: BN 610265

LT. WT.: 55,000 pounds

PLS Truck SN 44014

WT.: 54,750 pounds

IPF NO.: USAU0100189

WT.: 7,100 pounds

120MM PA116 Metal Pallets

WT.: 24,771 pounds

TOTAL SPECIMEN WT.: 141,621 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	<u>VELOCITY</u> <u>(MPH)</u>	<u>REMARKS</u>
1	Rear	4.16	2x2 bundle slid to rear.
2	Rear	6.25	2-inch gap at top of end wall.
3	Rear	8.21	Gap at end wall closed.
4	Forward	8.37	No damage.

NOTE: This railcar has cushioned draft gear.

RAIL IMPACT DATA

TEST NO.: 12

DATE: 15 June 1995

SPECIMEN LOAD: IPF with 155MM SLPs on PLS Trailer on Flatcar

FLATCAR NO.: BN 615005

LT. WT.: 55,000 pounds

PLS Trailer SN 42879

Wt.: 13,200 pounds

IPF NO.: USAU0100208

WT.: 7,100 pounds

155MM SLPs

WT.: 31,140 pounds

TOTAL SPECIMEN WT.: 106,440 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	VELOCITY	<u>REMARKS</u>
		<u>(MPH)</u>	
1	Forward	4.47	No load movement.
2	Forward	6.23	Excessive end wall movement.
3	Forward	8.28	End wall movement. Load was satisfactory.
4	Rear	8.37	End wall movement. No visible load damage.

Note:

1. Flatcar has friction draft gear.
2. After removing from the trailer, the extreme outside distance between the top of the ISO blocks was measured from facing the bailbar. The results were as follows:
 - a. Left side: 239 - 13/16 inches.
 - b. Right side: 239 - 3/4 inches.

RAIL IMPACT DATA

TEST NO.: 13

DATE: 15 June 1995

SPECIMEN LOAD: IPF with High CG Boxed Ammunition on PLS Trailer on Flatcar

FLATCAR NO.: BN 615005

LT. WT.: 55,000 pounds

PLS Trailer SN 42879

WT.: 13,200 pounds

IPF NO.: USAU0100147

WT.: 7,100 pounds

Boxed Ammunition with High CG

WT.: 27,824 pounds

TOTAL SPECIMEN WT.: 103,124 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	<u>VELOCITY (MPH)</u>	<u>REMARKS</u>
1	Rear	4.46	No load movement.
2	Rear	6.31	Excessive end wall movement.
3	Rear	8.37	End wall movement.
4	Forward	8.37	End wall movement. Top of flatrack appeared to be out of tolerance.

Note: The railcar used has friction draft gear.

RAIL IMPACT DATA

TEST NO.: 14

DATE: 20 June 1995

SPECIMEN LOAD: IPF with 120MM PA116 Metal Pallets on PLS Trailer on Flatcar

FLATCAR NO.: BN 615005

LT. WT.: 55,000 pounds

PLS Trailer SN 42879

Wt.: 13,200 pounds

IPF NO.: USAU0100189

Wt.: 7,100 pounds

Boxed Ammunition with High CG

Wt.: 24,771 pounds

TOTAL SPECIMEN WT.: 100,071 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	VELOCITY	<u>REMARKS</u>
		<u>(MPH)</u>	
1	Forward	4.36	No load movement.
2	Forward	6.31	No load movement.
3	Forward	8.43	3-inch gap between bail bar end wall and top of pallets.
4	Rear	8.37	Gap closed up at bail bar end of IPF.

Note: The railcar used has friction draft gear.

Changes in ISO outside envelope after each impact. Measurements are referenced from facing the bail bar end of the IPF.

<u>IMPACT</u>	<u>LEFT</u>	<u>RIGHT</u>
Start	239-3/16	239-1/16
1	240	239-5/8
2	239-1/2	239-1/4
3	240	239-13/16
4	241	240-5/8

RAIL IMPACT DATA

TEST NO.: 15

DATE: 20 June 1995

SPECIMEN LOAD: IPF with 120MM Metal Pallets on PLS Truck on Flatcar

FLATCAR NO.: BN 610265

LT. WT.: 55,000 pounds

PLS Truck SN 44014

WT.: 54,750 pounds

IPF NO.: USAU0100208

WT.: 7,100 pounds

155MM SLPs

WT.: 31,140 pounds

TOTAL SPECIMEN WT.: 147,990 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	VELOCITY	<u>REMARKS</u>
		<u>(MPH)</u>	
1	Forward	4.54	No load movement.
2	Forward	6.52	1-inch gap at rear wall.
3	Forward	8.61	No change.
4	Rear	8.70	PLS hook arm bounced.

Note: This railcar has cushioned draft gear.

Changes in the ISO outside envelope dimensions after each impact. Measurements are referenced from facing the bail bar end of the IPF. Dimensions are in inches.

<u>IMPACT</u>	<u>LEFT</u>	<u>RIGHT</u>
Start	240-3/4	240-11/16
1	240-3/4	240-5/8
2	241	240-7/8
3	241-1/2	241
4	241-1/8	241-1/8

RAIL IMPACT DATA

TEST NO.: 16

DATE: 21 June 1995

SPECIMEN LOAD: IPF with 155MM SLPs on PLS Trailer on Flatcar

FLATCAR NO.: BN 615005

LT. WT.: 55,000 pounds

PLS Trailer SN 42879

WT.: 13,200 pounds

IPF NO.: USAU0100208

WT.: 7,100 pounds

155MM SLPs

WT.: 31,140 pounds

TOTAL SPECIMEN WT.: 106,440 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	VELOCITY	<u>REMARKS</u>
		<u>(MPH)</u>	
1	Rear	4.49	No load movement.
2	Rear	6.41	Observable end wall movement.
3	Rear	8.29	End wall movement.
4	Rear	8.39	End wall movement. No visible load damage.

Note: Flatcar has friction draft gear.

Changes in the ISO outside envelope dimensions after each impact. Measurements are referenced from facing the bail bar end of the IPF. Dimensions are in inches.

<u>IMPACT</u>	<u>LEFT</u>	<u>RIGHT</u>
Start	240-3/4	240-3/4
1	241-1/16	241-1/16
2	241-1/2	241-1/2
3	242-1/2	242-3/8
4	242-5/8	242-1/2

RAIL IMPACT DATA

TEST NO.: 17

DATE: 21 June 1995

SPECIMEN LOAD: IPF with High CG Boxed Ammunition on PLS Truck on Flatcar

FLATCAR NO.: BN 610265

LT. WT.: 55,000 pounds

PLS Truck SN 44014

WT.: 54,750 pounds

IPF NO.: USAU0100147

Wt.: 7,100 pounds

Boxed Ammunition

Wt.: 27,824 pounds

TOTAL SPECIMEN WT.: 144,674 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	<u>VELOCITY</u> <u>(MPH)</u>	<u>REMARKS</u>
1	Rear	4.54	No load movement.
2	Rear	6.23	End walls noticeably spreading.
3	Rear	8.62	Observable end wall whip.
4	Forward	8.75	3-inch gap between top of load and rear end wall.

Note: This railcar has cushioned draft gear.

Changes in the ISO outside envelope dimensions after each impact. Measurements are referenced from facing the bail bar end of the IPF. Dimensions are in inches.

<u>IMPACT</u>	<u>LEFT</u>	<u>RIGHT</u>
Start	241	241-1/8
1	241-1/2	241-3/4
2	241-3/4	242
3	242	242-1/8
4	242-1/8	242-3/8

RAIL IMPACT DATA

TEST NO.: 18

DATE: 21 June 1995

SPECIMEN LOAD: IPF with MLRS Pods on PLS Truck on Flatcar

FLATCAR NO.: BN 610265 LT. WT.: 55,000 pounds

PLS Truck SN 44014 WT.: 54,750 pounds

IPF NO.: USAU0100255 WT.: 7,100 pounds

Multiple Launch Rocket System (MLRS) WT.: 20,820 pounds

TOTAL SPECIMEN WT.: 136,670 pounds

BUFFER CAR (FIVE CARS) WT.: 250,000 pounds

<u>IMPACT</u>	<u>END STRUCK</u>	VELOCITY	<u>REMARKS</u>
		<u>(MPH)</u>	
1	Forward	4.48	No load movement.
2	Forward	6.27	Noticeable shock mount action on MLRS pod on top layer.
3	Forward	8.46	Top pod moved on shock mounts.
4	Rear	8.76	No visible damage to load.

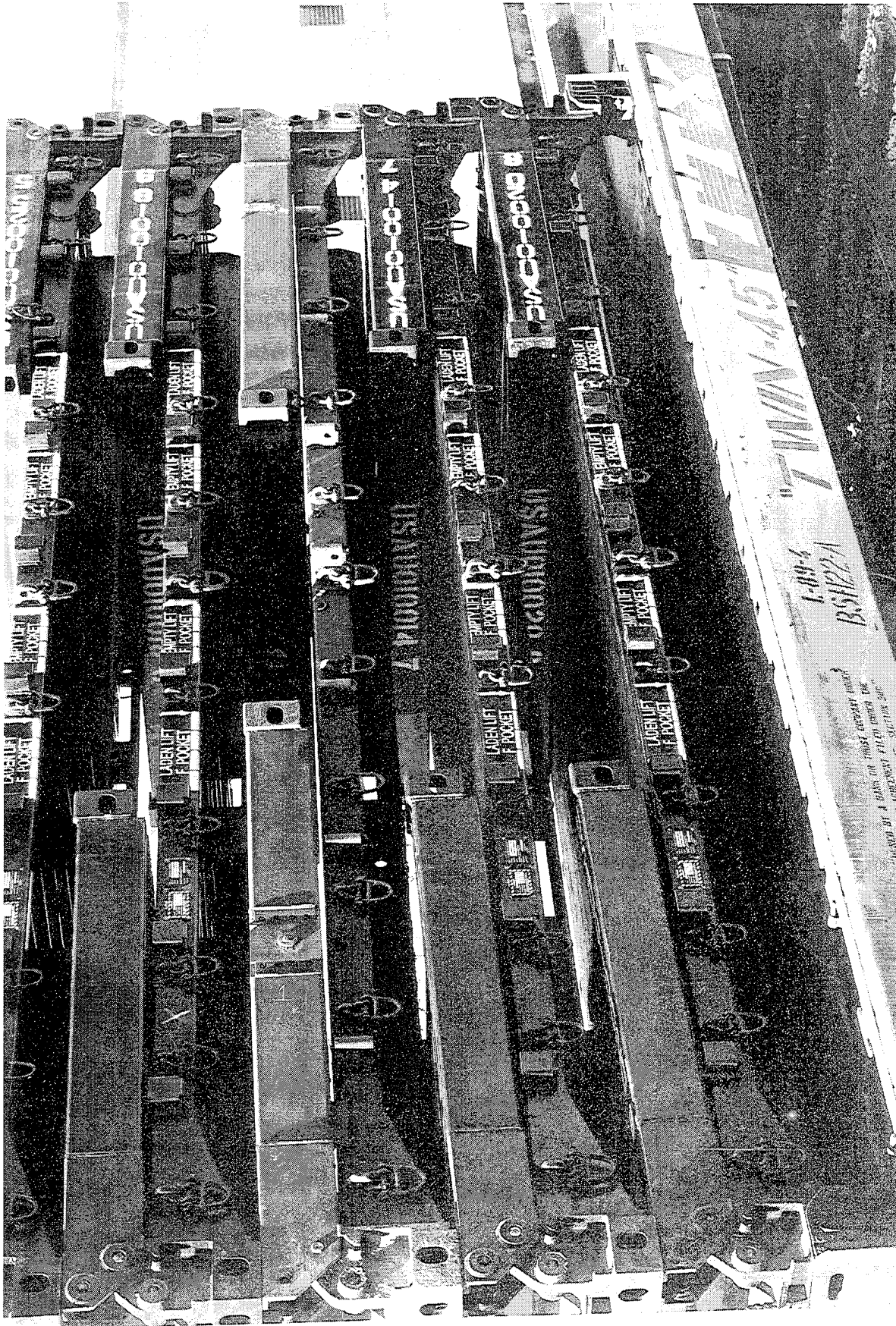
Note: This railcar has cushioned draft gear.

Changes in the ISO outside envelope dimensions after each impact. Measurements are referenced from facing the bail bar end of the IPF. Dimensions are in inches.

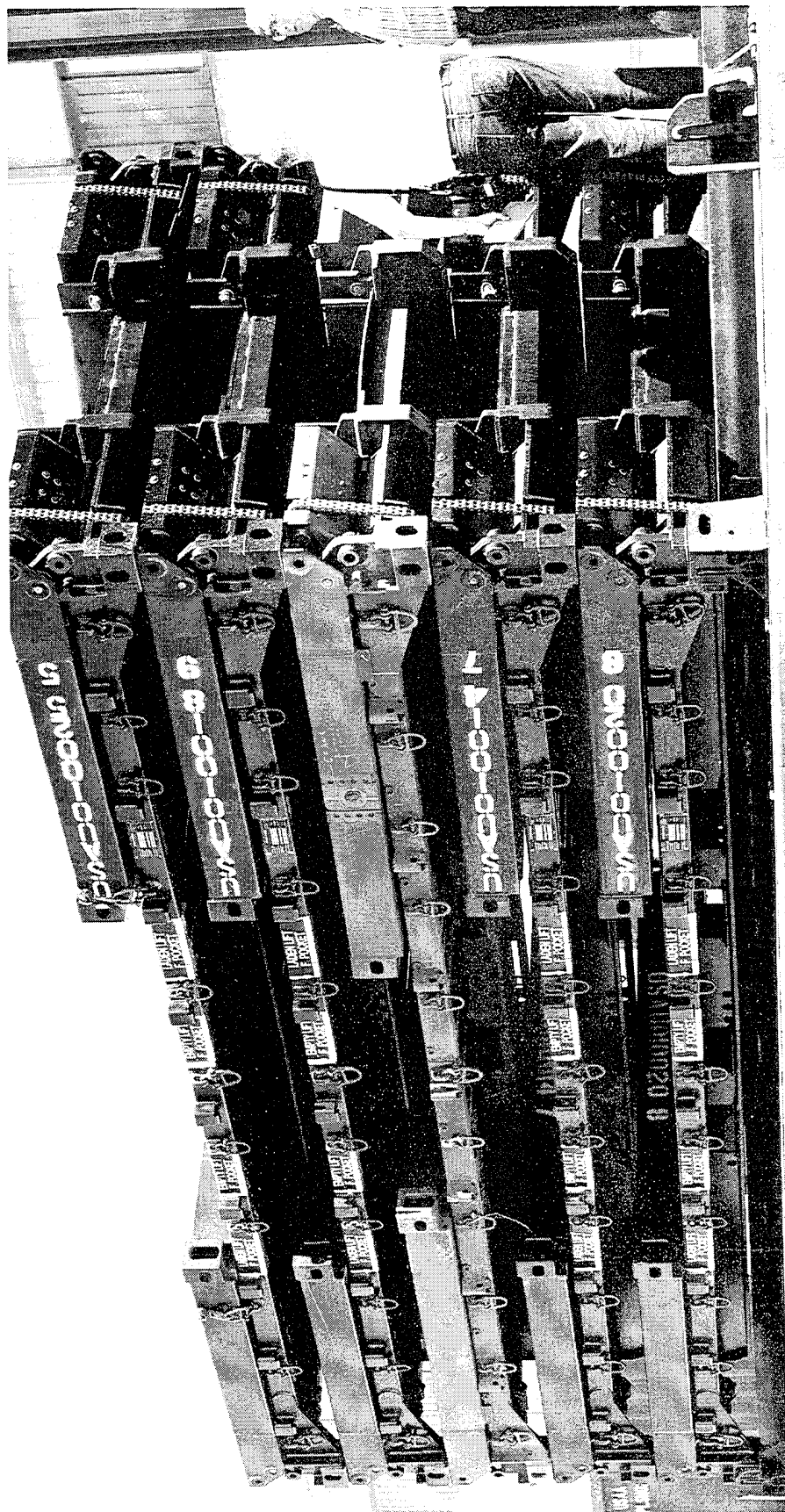
<u>IMPACT</u>	<u>LEFT</u>	<u>RIGHT</u>
Start	239-1/4	239-3/16
1	238-3/4	238-3/4
2	238-3/4	238-3/4
3	238-7/8	238-7/8
4	238-15/16	239

PART 5

PHOTOGRAPHS

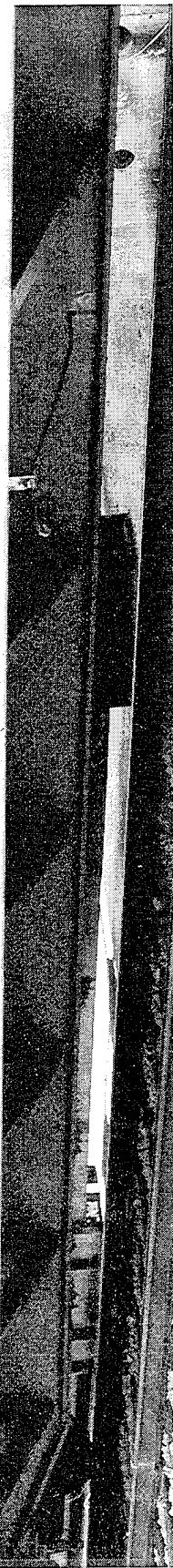


	U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL	
Photo No. A0317-SCN95-134-1944. This is a closeup of the PLS IPF folded in retrograde shipment configuration of five high. They are mounted on a cushioned COFC used in rail transportation testing.		



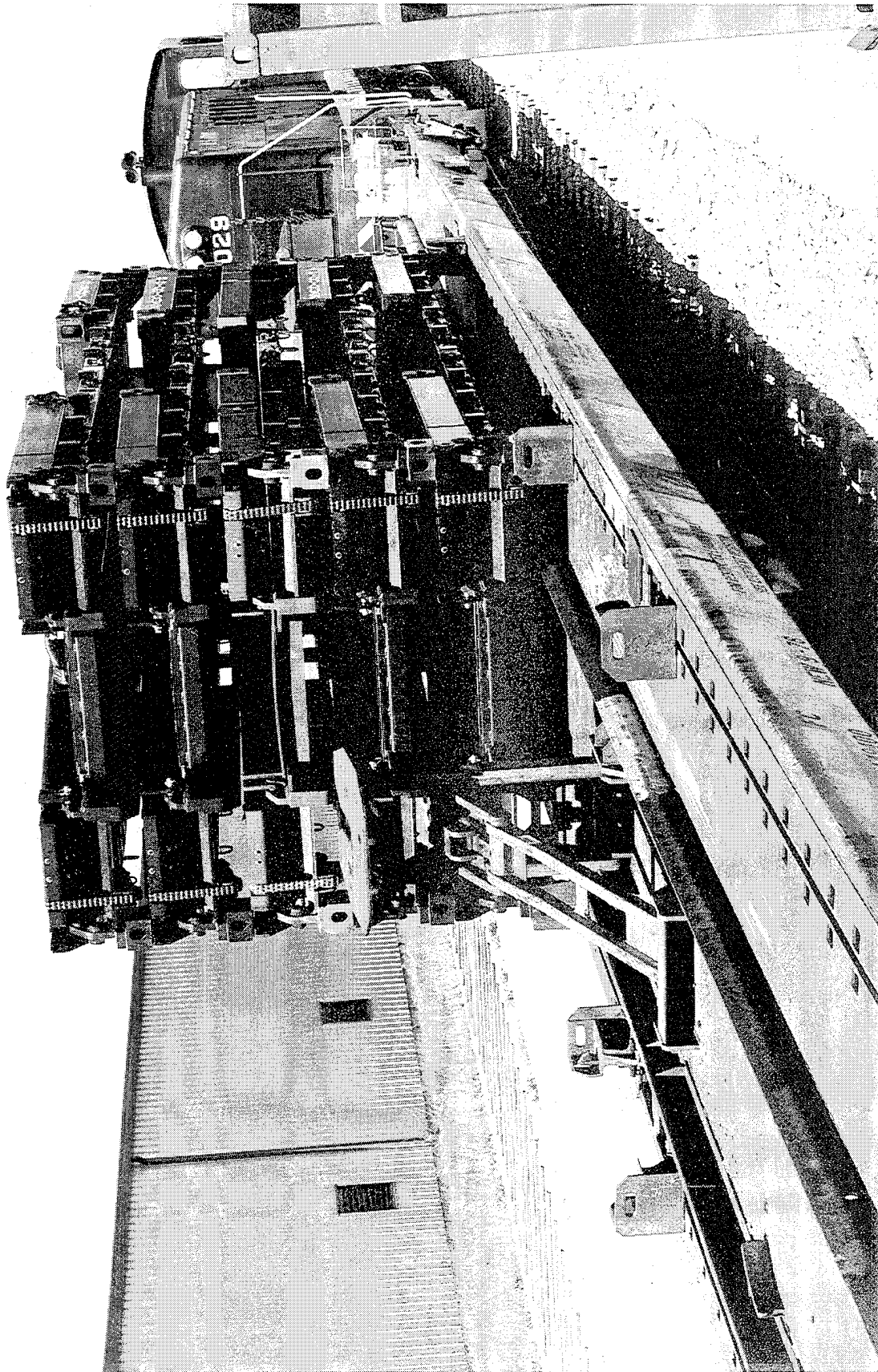
FOR RESTRICTED LOADING ONLY
SEE EMPLOYMENT REGISTER

NEW 9-78



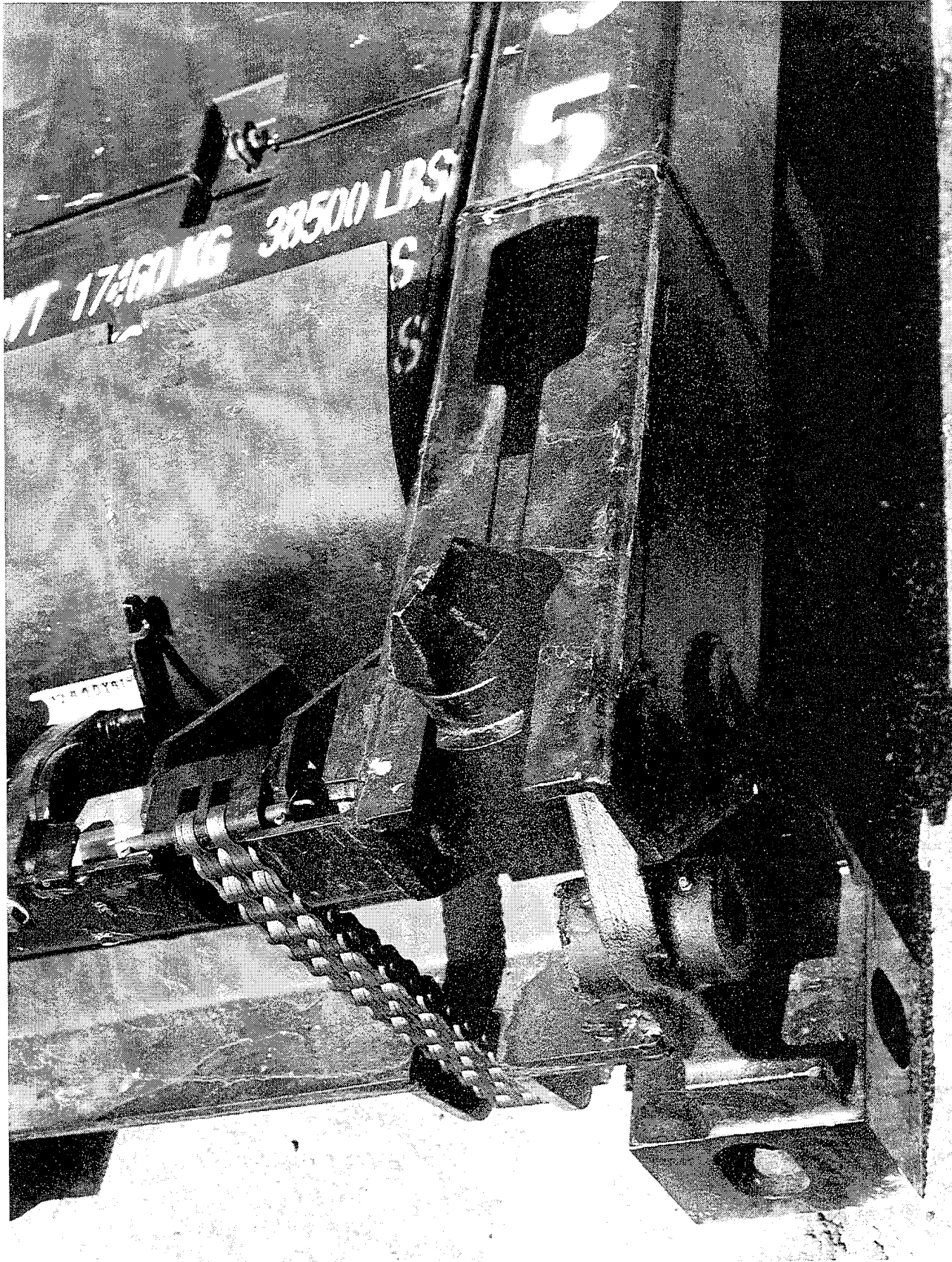
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL

Photo No. A0317-SCN95-134-1946. This is a closeup of the PLS IPF folded in retrograde shipment configuration of five high. They are mounted on a cushioned COFC used in rail transportation testing. Note the web strap on the top IPF, it is necessary to keep the IPF end walls from bouncing upward during transportation.



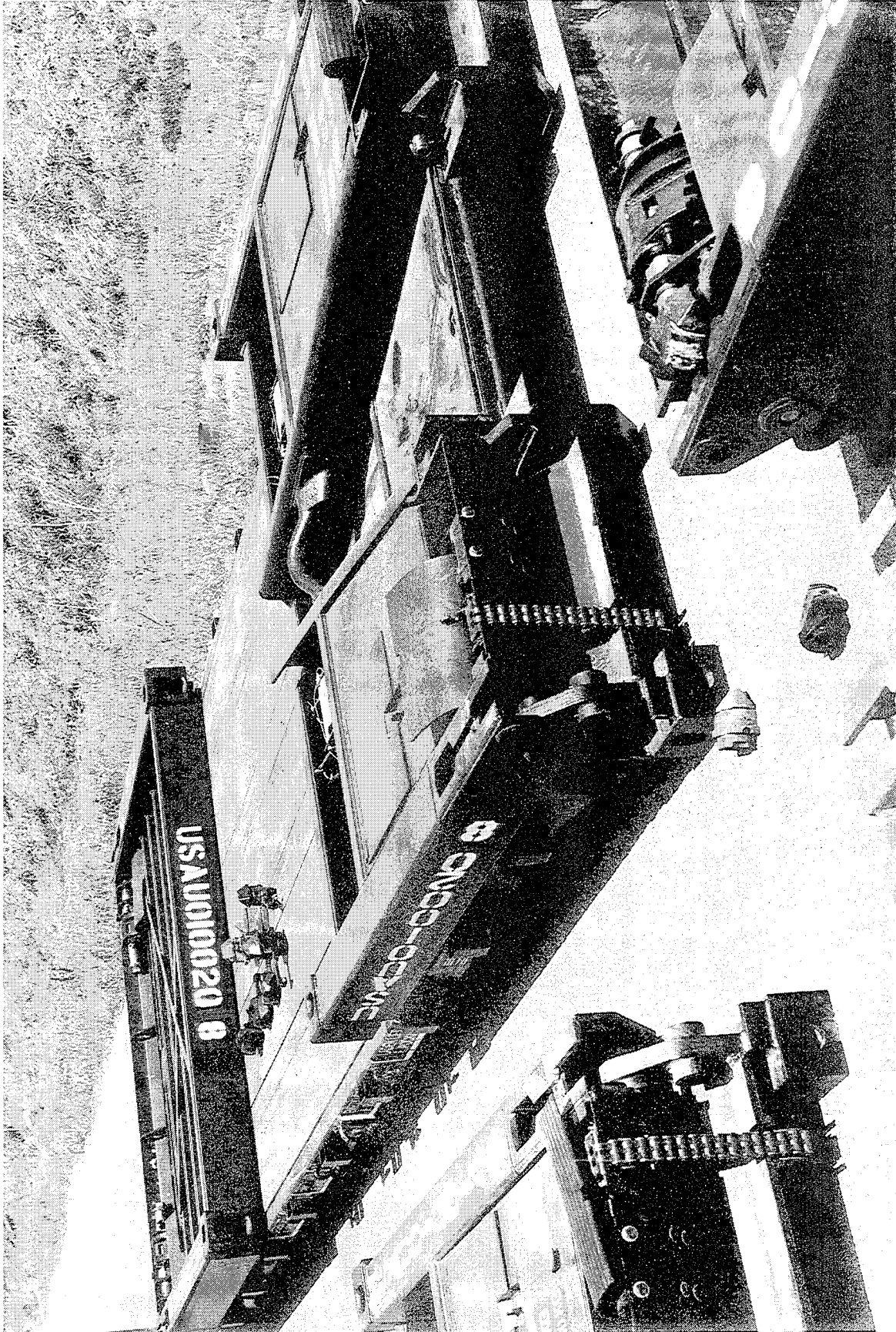
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No. A0317-SCN95-134-1943. This is a closeup of the PLS IPF folded in retrograde shipment configuration of five high. They are mounted on a cushioned COFC used in rail transportation testing.

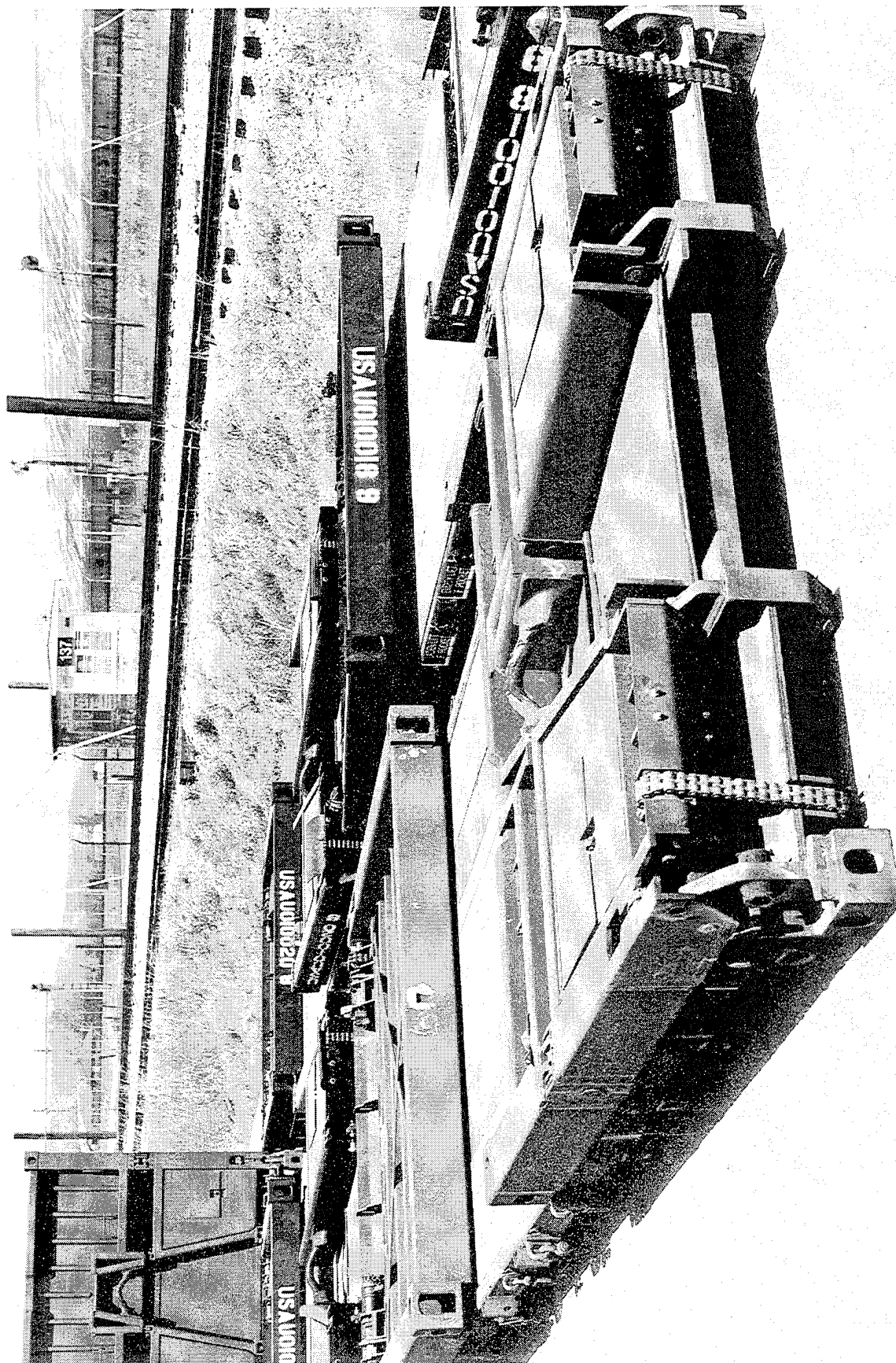


U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No. A0317-SCN95-134-1555. The PLS IPF ISO interlock fitting is positioned for loading a second IPF onto it for retrograde shipment. The ISO fitting can be easily bent downward when the operator loading the second IPF does not make proper alignment with the lower IPF.

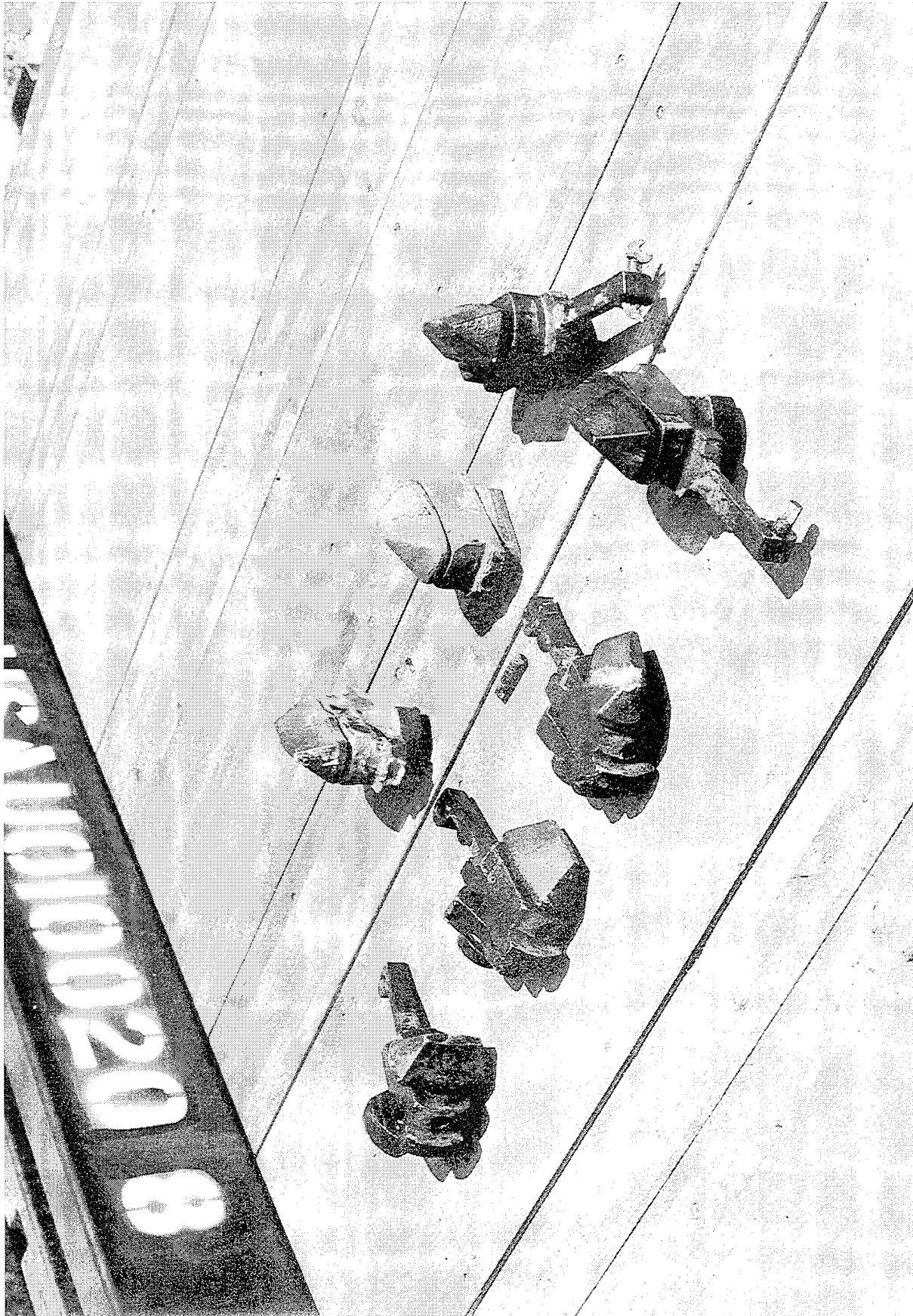


	U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL	
Photo No. A0317-SCN95-134-1551. This photo shows the broken ISO interlock fittings on the PLS IPF following rail impact testing. The PLS EPF was used as a filler for a load of five high. The EPF interlock fittings also broke as a result of rail impact testing.		



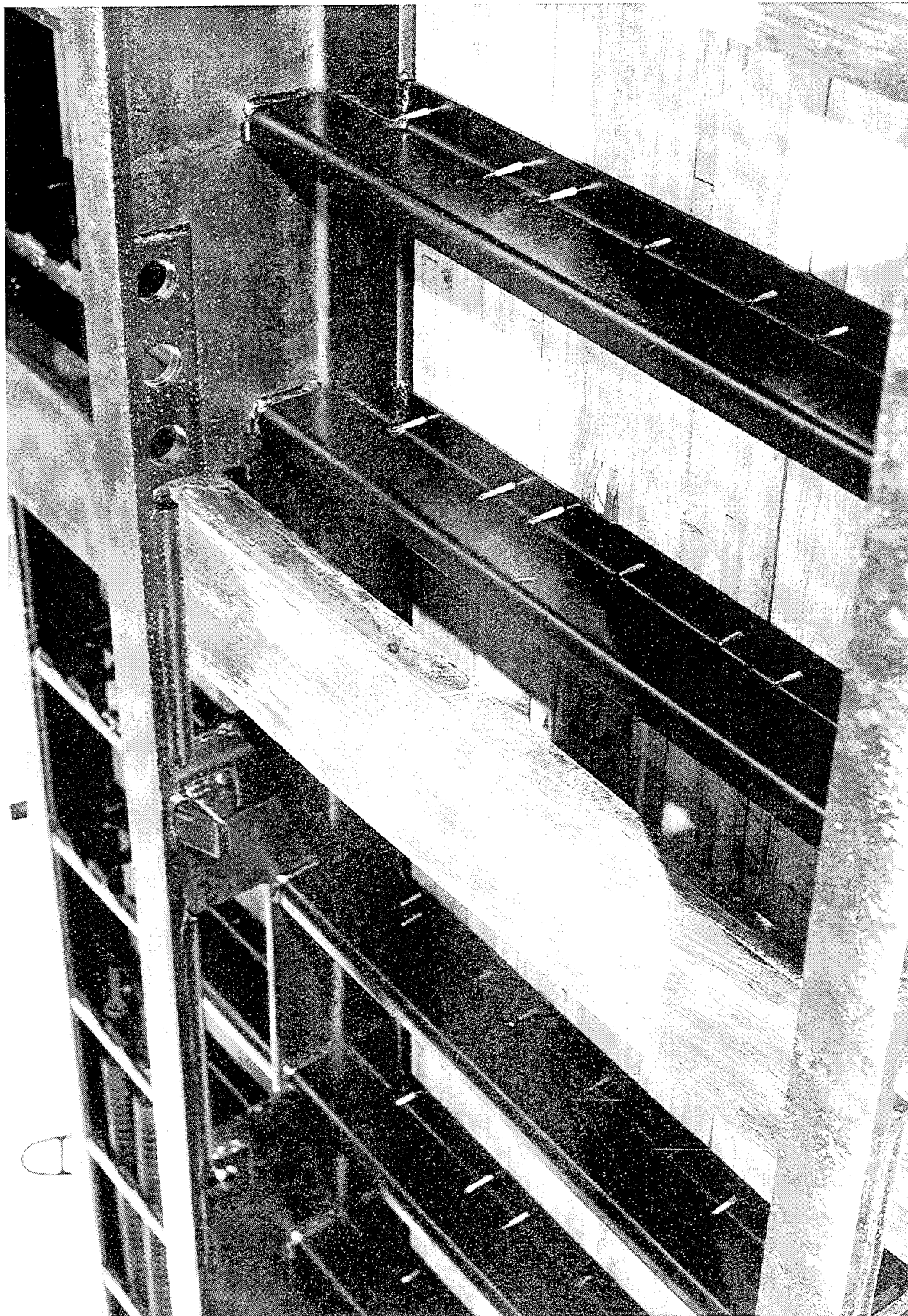
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No. A0317-SCN95-134-1552. This photo shows the broken ISO interlock fittings on the PLS IPF following rail impact testing. The PLS EPF was used as a filler for a load of five high. The EPF interlock fittings also broke as a result of rail impact testing.



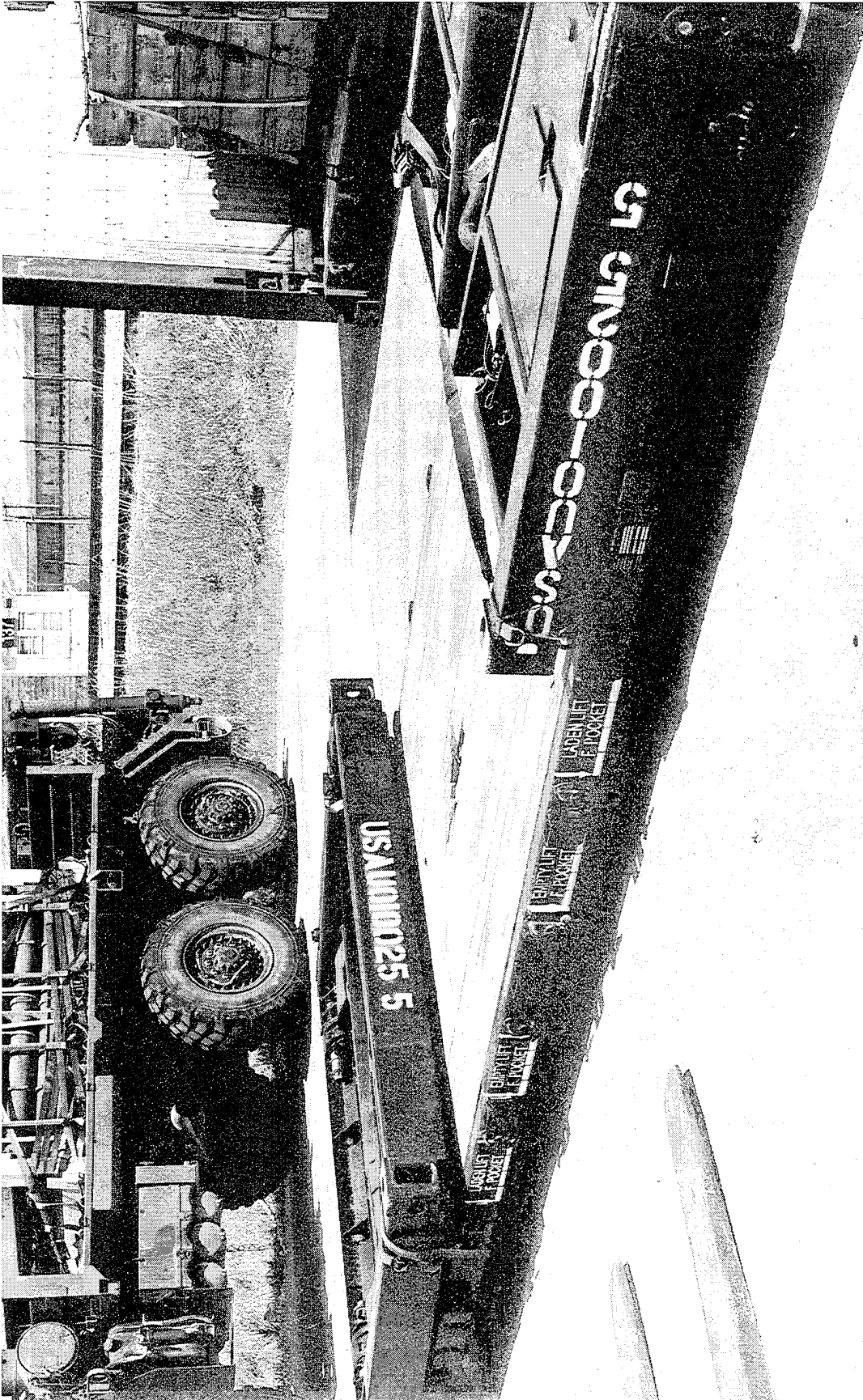
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No AO317-SCN95-134-1550. This photo shows a sample of the failed ISO fittings and modes of failure.

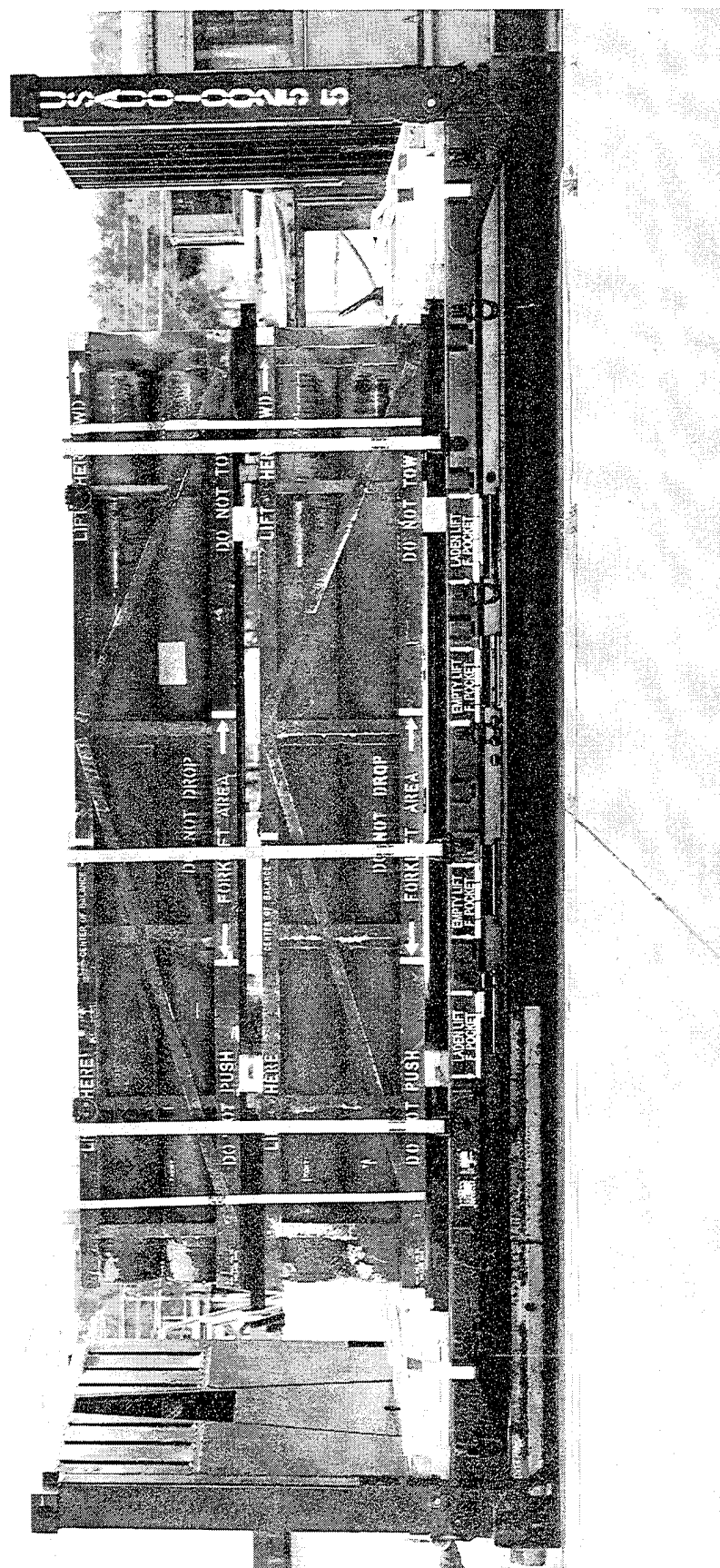


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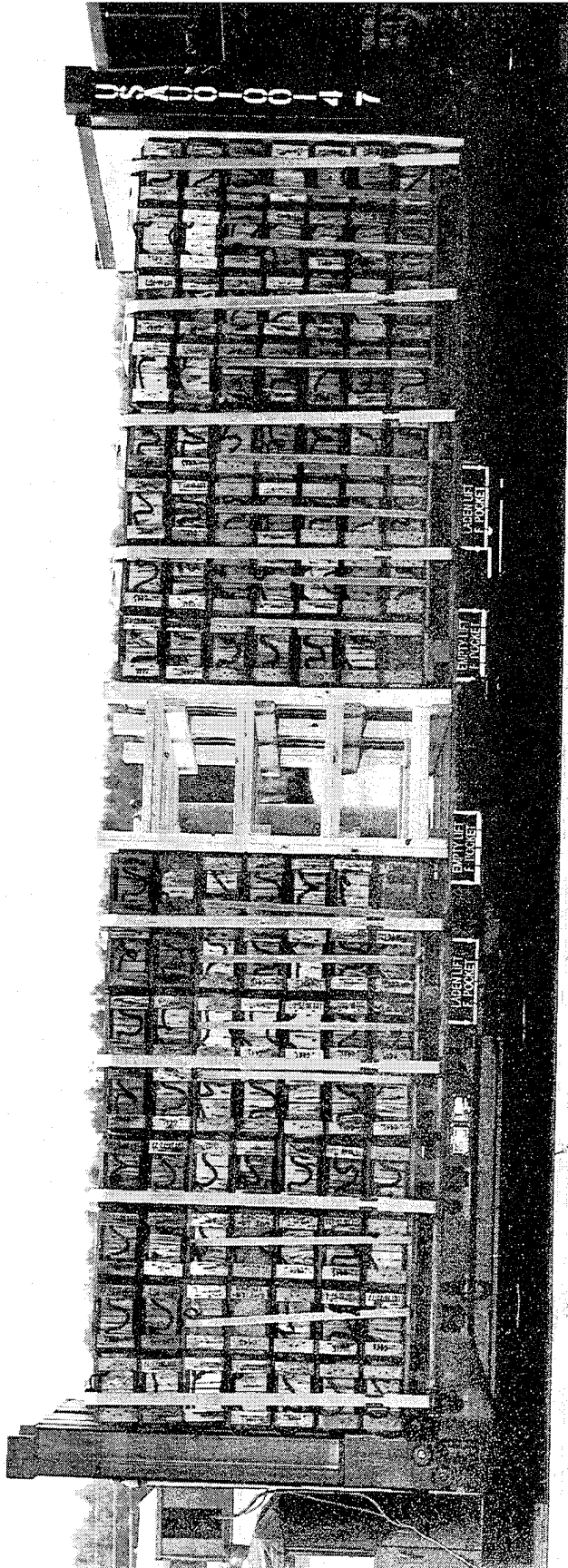
Photo No. A0317-SCN95-134-1553. This is a view of the bottom of the PLS IPF with a forklift tine inserted in the pockets. There is a lack of protection above the forklift tine. There is nothing to prevent the point on a forklift tine from puncturing the underside of the IPF deck. Note the broken deck boards. Some of the boards used to fabricate the deck were dry rotted.



	U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL	
Photo No. A0317-SCN95-134-1549. The PLS IPF is designed to be handled with a forklift. There is no protection between the forklift tines and the underside of the deck. Should the flatrack slip on the tines, it is possible, as shown, to punch a hole in the deck.		

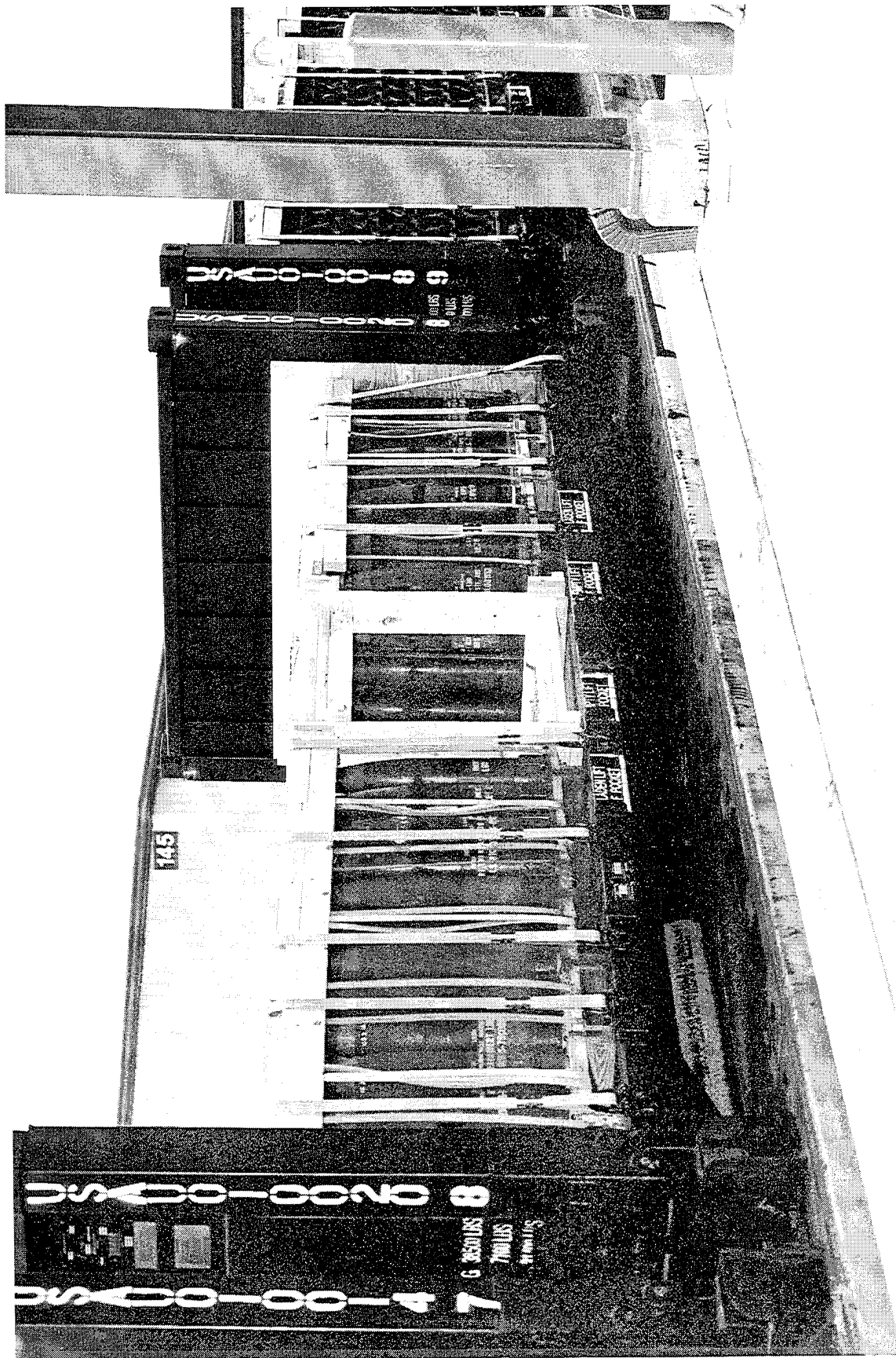


	U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL
Photo No. A0317-SCN95-134-1931. This photo shows the Multiple Launch Rocket System (MLRS) pods configured for rail shipment. They are being transported on a COFC.	



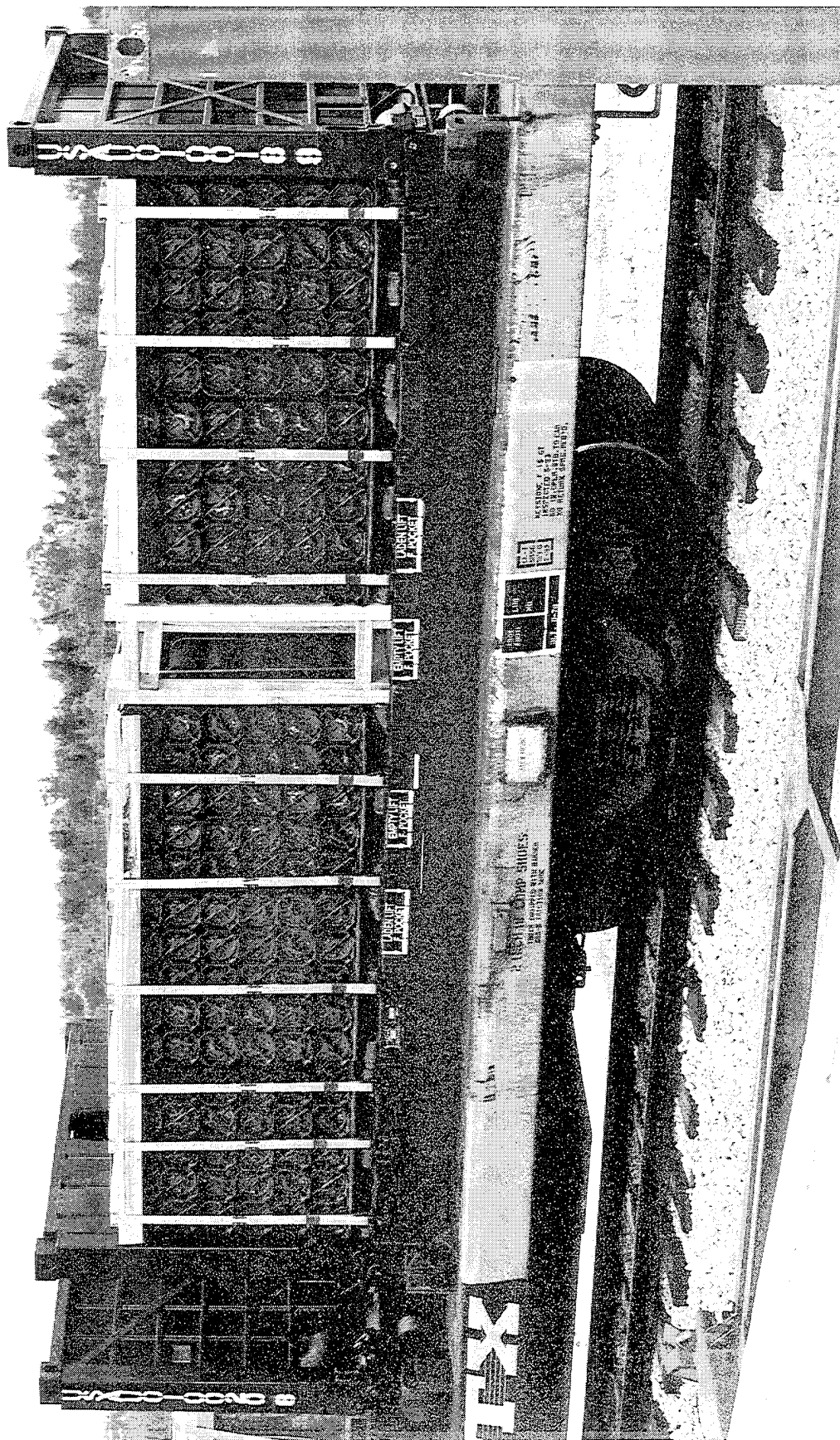
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No. A0317-SCN95-134-1930. This photo shows a high center of gravity (CG) load of boxed ammunition. The boxes are inertly-loaded. Note the plywood at the right side of the boxed load and the end wall. The end wall has a ribbed surface that will cut into the boxed ammunition. The plywood is used to prevent damage to the ammunition boxes.



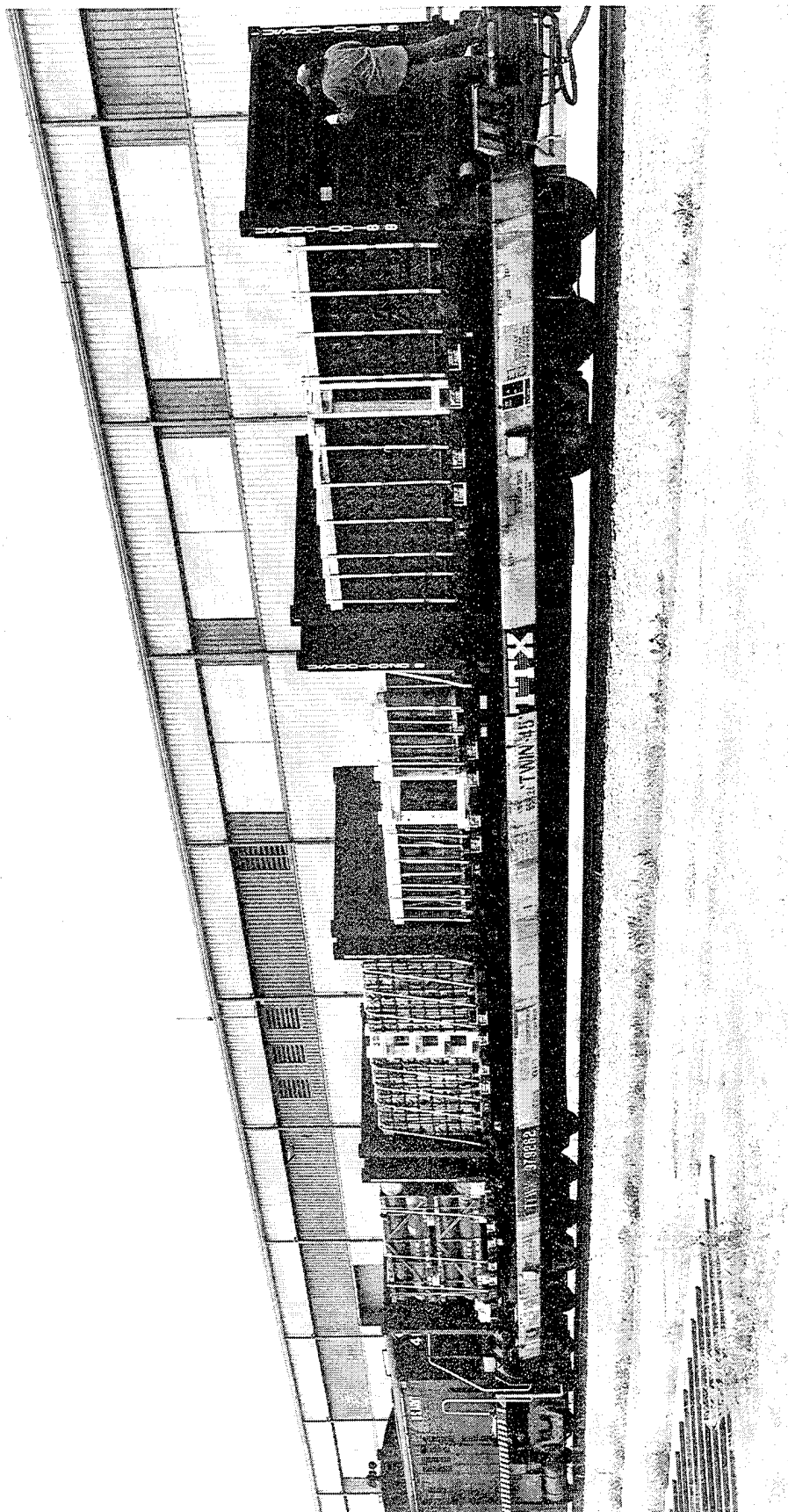
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No. A0317-SCN95-134-1929. This photo shows the 155MM SLPs. Plywood is used between the SLP pallets and the end wall to prevent damage to the SLP pallets from the vertical ribs on the PLS IPF end wall. The previous version of the IPF had a wooden deck in place of the ribbed sheet metal.



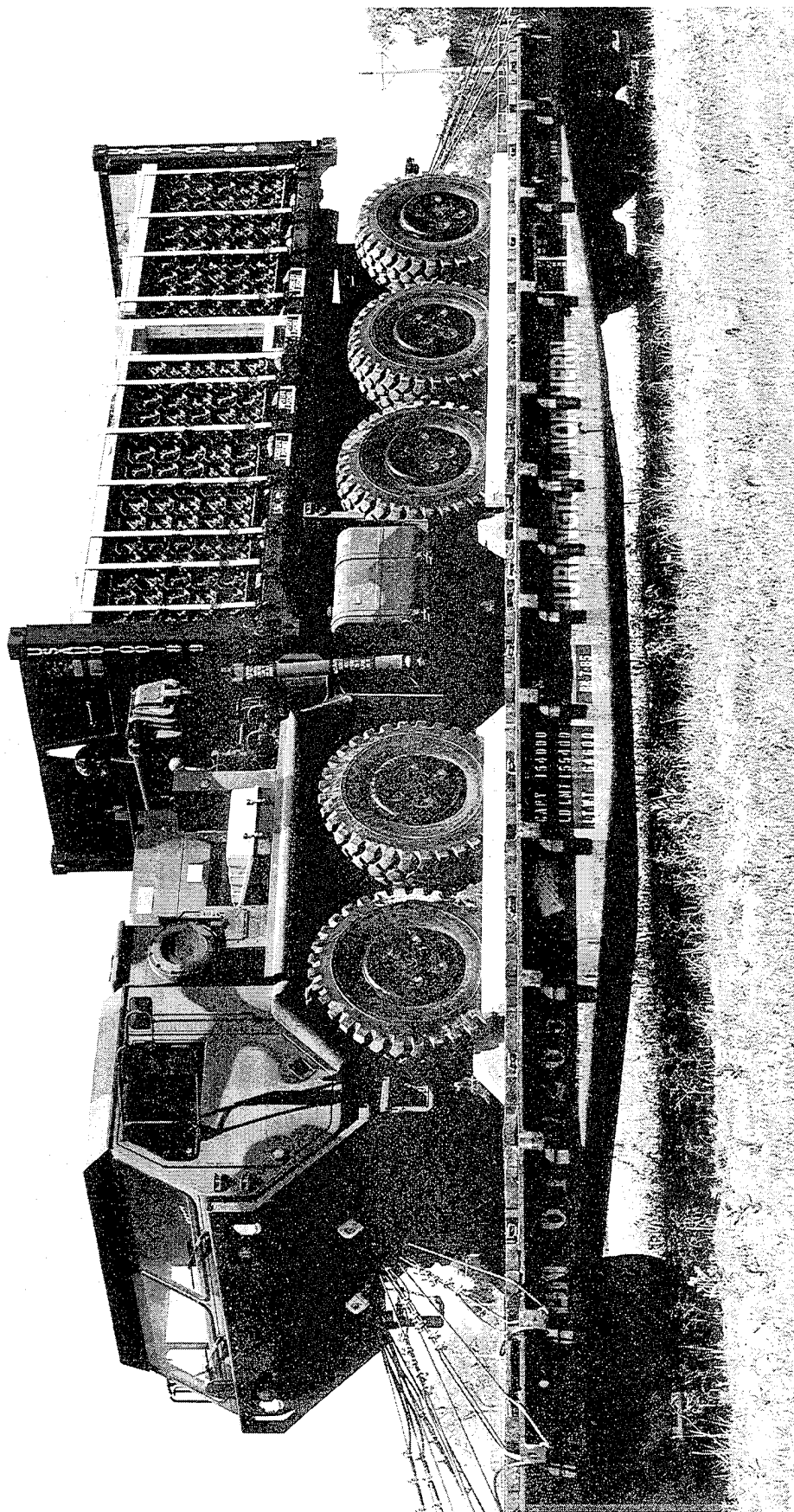
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

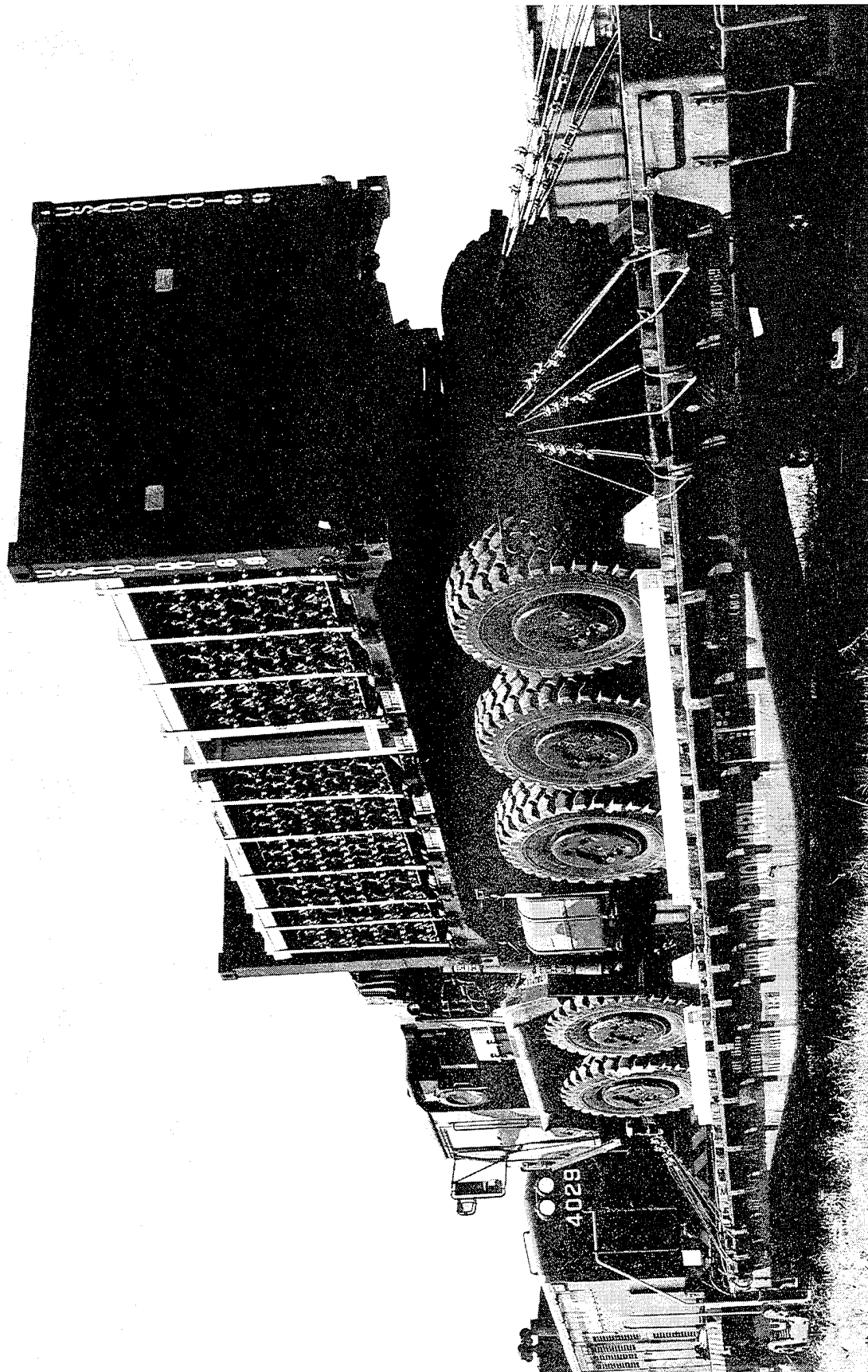
Photo NO. A0317-SCN95-134-1926. This photo shows the 120MM PA16 tank ammunition pallet load. Two-inch metal bands are used to hold the pallets on the flatcar during rail transportation. Center fill is used to maintain a continuous tight load during transportation.



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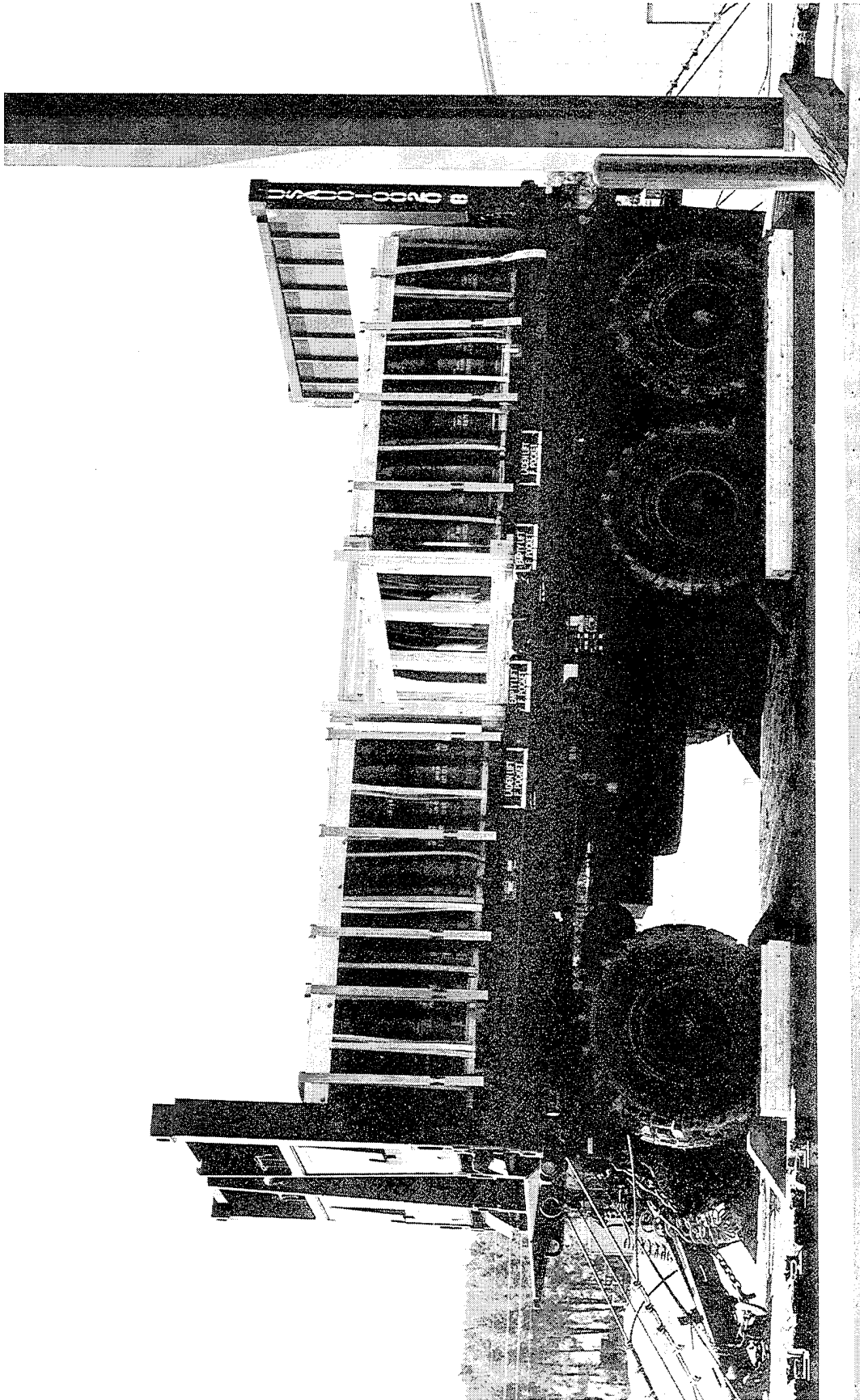
Photo No. A317-SCN95-134-1947. This photo shows four PLS IPFs on a COFC. The ammunition loads are configured for rail transportation; namely, 2-inch metal banding to hold the loads in place as well as reducing the risk of pilferage along the rail transportation route.





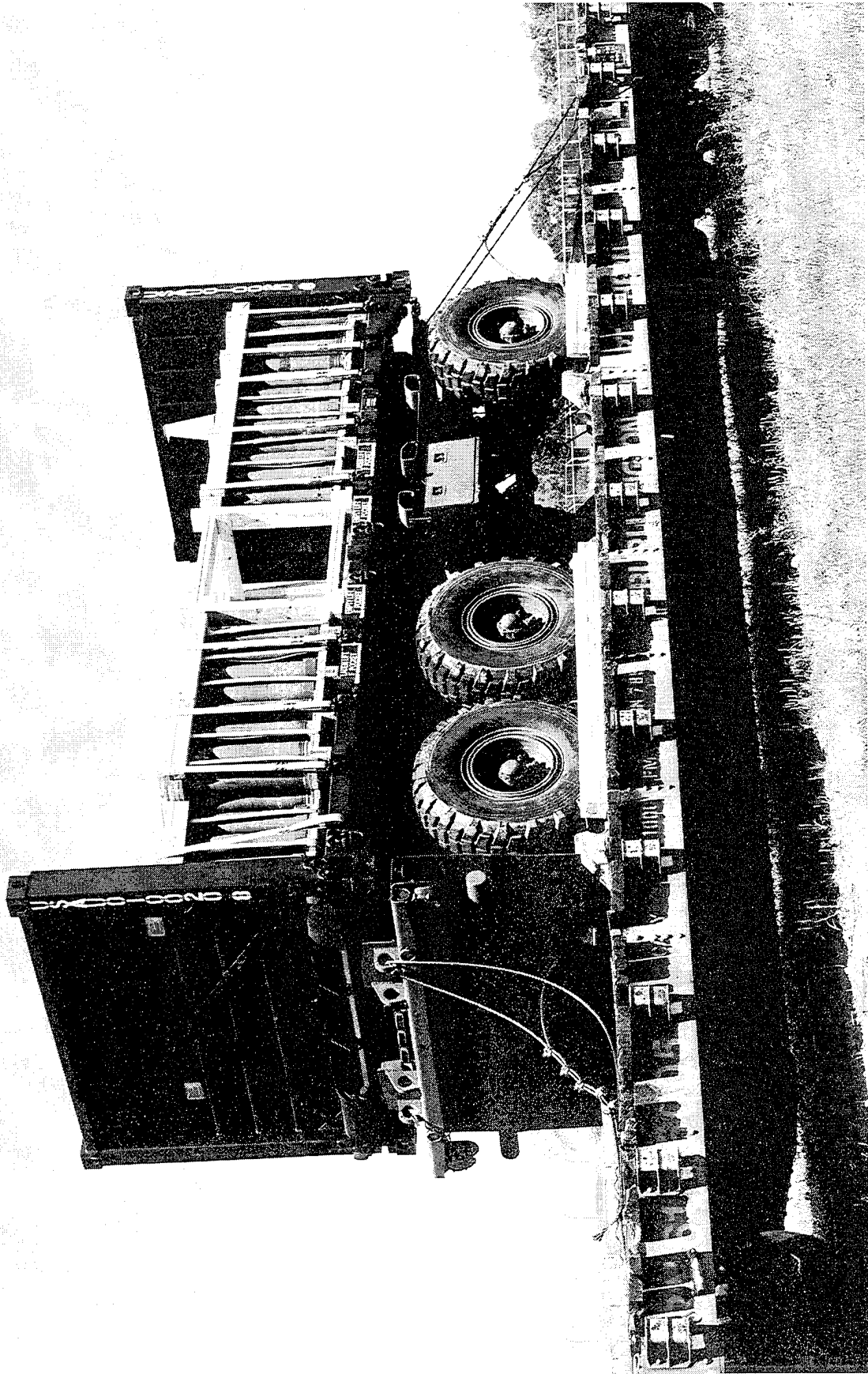
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No. A0317-SCN95-134-1936. This photo shows the PLS truck cabled to a 60-foot flatcar. The PLS IPF is loaded with 120MM PA116 tank ammunition metal pallets. This is the configuration used for testing three other PLS IPF loads on the PLS truck during rail transportation.



U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No. A0317-SCN95-134-1942. This photo shows the PLS trailer loaded with 155MM SLPs. This is the heaviest test load. The trailer is tied to the 50-foot railcar with four 5/8-inch cables. After the third impact at 8 mph, the rear cables broke. The number of cables were doubled for subsequent tests.



U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL -
SAVANNA, IL

Photo No. A0317-SCN95-134-1937. This photo shows the PLS trailer with a PLS IPF loaded with 155MM SLPs. Note the loose cables, this resulted from a rail impact at 8 mph.

PART 6

DRAWINGS

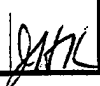
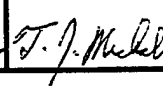
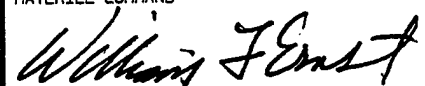
LOADING AND TIEDOWN PROCEDURES FOR CONVENTIONAL AMMUNITION ITEMS LOADED ON THE PALLETIZED LOADING SYSTEM (PLS) A-FRAME FLATRACK (M1077), AND/OR THE ISO COMPATIBLE PLS FLATRACK (IPF) (M1), FOR RAPID DEPLOYMENT BY RAIL AND SHIP

INDEX

<u>ITEM</u>	<u>PAGE(S)</u>
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LOADS ON A-FRAME FLATRACK - - - - -	22-35
DETAILS - - - - -	36-58

- THE PROCEDURES DEPICTED WITHIN THIS DRAWING ARE FOR TRANSPORTING CONVENTIONAL AMMUNITION ITEMS LOADED ON THE PALLETIZED LOADING SYSTEM (PLS) A-FRAME AND/OR M1 FLATRACKS, BY RAIL AND/OR SHIP. HOWEVER, THEY MAY ALSO BE USED FOR ON AND/OR OFF HIGHWAY MOVEMENT, IF DESIRED.

DO NOT SCALE

DEPARTMENT OF ARMY DRAWING			
	DRAFTSMAN	TECHNICIAN	ENGINEER
	B. LEONARD		J. SIMONS
	VALIDATION ENGINEERING DIVISION	TRANSPORTATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE
OCTOBER 1994	 W. F. Smith  T. J. Mullen		
DRAWING NUMBER	APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  W. F. Smith		
DA-114	U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL		

PROJECT DA 15-93

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR-740-1.
- B. THIS DRAWING COVERS PROCEDURES APPLICABLE TO THE TRANSPORT OF CONVENTIONAL AMMUNITION ITEMS, SECURED ON THE PALLETIZED LOADING SYSTEM (PLS) M1077 A-FRAME AND/OR M1 IPF FLATRACK, FOR RAPID DEPLOYMENT BY RAIL AND SHIP. THESE PROCEDURES MAY ALSO BE USED FOR ON AND/OR OFF HIGHWAY TRANSPORT. IF THE PLANNED METHOD OF TRANSPORT IS ONLY ON AND/OR OFF HIGHWAY, USE THE LOADING AND TIEDOWN PROCEDURES DEPICTED IN AMC DRAWING 19-48-4903-CA1704.
- C. DEPICTED PROCEDURES APPLY TO M1077 A-FRAME FLATRACKS HAVING AN ALL METAL CARGO DECK AREA 19'-0" LONG BY 7'-6-3/4" WIDE, EQUIPPED WITH ELEVEN TIEDOWN ANCHORS ON EACH SIDE AND FOUR ON EACH END. THE EMPTY FLATRACK WEIGHT IS 3,200 POUNDS AND THE LOAD CAPACITY IS 33,000 POUNDS. THE DEPICTED PROCEDURES ALSO APPLY TO THE M1 FLATRACK WHICH HAS A WOOD AND METAL CARGO DECK AREA 18'-6" LONG BY 7'-6-1/2" WIDE. EQUIPPED WITH ELEVEN TIEDOWN ANCHORS ON EACH SIDE. THE EMPTY FLATRACK WEIGHT IS 7,500 POUNDS AND THE LOAD CAPACITY IS 28,750 POUNDS.
- D. ALL LOADS SHOWN HEREIN ARE TYPICAL AND ARE BASED ON TESTED PROCEDURES FOR THE M1077 AND/OR THE M1 FLATRACKS WITH MAXIMUM WEIGHT LOADS, LOADED ON THE PLS VEHICLE AND TRAILER, WHICH WERE SECURED TO FLAT CARS. EACH LOADED FLATRACK WAS ALSO SECURED DIRECTLY TO THE FLOOR OF THE FLAT CAR. COMBINATIONS OF PROCEDURES MAY BE USED ON THE FLATRACKS, HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE.
- E. BECAUSE OF THE FACT THAT ALL LOADS SHOWN HEREIN ARE TYPICAL IT IS MOST LIKELY THAT THE ACTUAL QUANTITY TO BE TRANSPORTED WILL NOT BE DEPICTED. IN ORDER TO MAINTAIN SIMILARITY FROM ONE LOAD TO ANOTHER, INSTALLATIONS WHICH MAKE MULTIPLE SHIPMENTS OF THE SAME ITEM, SHOULD MAKE AN ACTUAL PENCIL SKETCH OF THE LOAD, USING THE VARIOUS TYPICAL LOADS AND PROCEDURES SHOWN HEREIN FOR GUIDANCE. THE SKETCH WOULD BE ADVANTAGEOUS FOR MAXIMUM LOADS USING A MINIMUM QUANTITY OF STEEL STRAPPING AND DUNNAGE ASSEMBLIES.
- F. PROCEDURES DEPICTED HEREIN ARE TYPICAL IN NATURE RELATIVE TO ITEM LOCATION ON THE FLATRACK AND THE QUANTITIES SHOWN. ITEM LOCATION AND QUANTITIES OF THE DESIGNATED ITEM MAY BE VARIED TO SATISFY OPERATIONAL REQUIREMENTS, PROVIDED LOADING AND TIEDOWN PROCEDURES SPECIFIED HEREIN ARE RETAINED.
- G. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.
- H. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- STRAPPING, STEEL - - : ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
- EDGE PROTECTOR - - - : STEEL, FOR 2" STEEL STRAPPING.

(GENERAL NOTES CONTINUED)

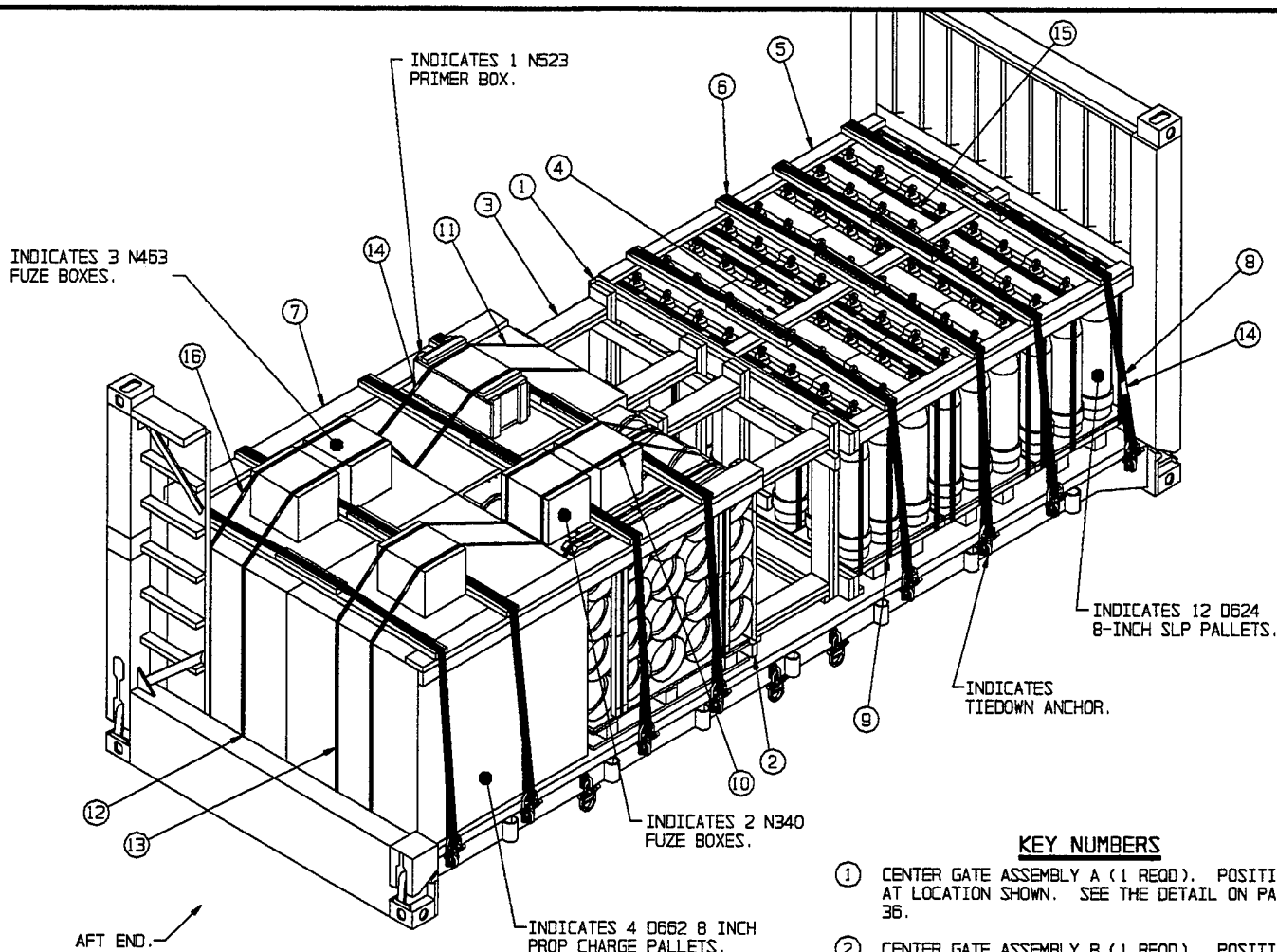
- J. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN LAMINATING DUNNAGE.
- K. CAUTION: NAILING THROUGH ANY PORTION OF AMMUNITION PACKAGES AS A MEANS TO SUPPORT THE BRACING OR ANY TYPE OF DUNNAGE IS PROHIBITED. ALL NAILING WILL BE WITHIN THE DUNNAGE, AS SPECIFIED HEREIN.
- L. WHEN 2" STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED.
- M. WHEN 3/4" AND/OR 1-1/4" STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, USE ONE SEAL WITH TWO PAIR OF CRIMPS.
- N. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT APPROXIMATELY 1/4" TO 3/8" LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. MEASUREMENTS FOR STRUT LENGTHS NEED TO BE ACCOMPLISHED AT SEVERAL PLACES DURING THE BLOCKING AND BRACING PROCESS. CARE MUST BE EXERCISED WHEN MEASURING FOR AND INSTALLING STRUTS. THE SPECIFIED APPROXIMATE DIMENSION FOR A STRUT LENGTH MAY BE ADJUSTED, AS NECESSARY, TO PROVIDE FOR A TIGHTLY BLOCKED LOAD. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE.
- O. WHEN REFERRING TO THE PALLET UNIT LENGTH OR UNIT WIDTH, THE 40" OR 35" DIMENSION OF THE PALLET BASE CONSTITUTES THE PALLET UNIT LENGTH AND THE 48" OR 45-1/2" DIMENSION CONSTITUTES THE PALLET UNIT WIDTH. WHEN REFERRING TO THE SKIDDED UNIT LENGTH OR UNIT WIDTH, THE LENGTH OF THE BOXES CONSTITUTES THE WIDTH OF THE SKIDDED UNIT.
- P. ANY REFERENCE TO "PALLET" WITHIN THIS DOCUMENT MEANS PALLET UNIT AND/OR SKIDDED UNIT.
- Q. FOR ADDITIONAL GUIDANCE SEE THE "LOADING PROCEDURES" ON PAGE 3 AND THE "SPECIAL NOTES" ON EACH LOAD PAGE.
- R. SOME OF THE LOADS SHOWN HEREIN MAY CONTAIN EXPLOSIVE INCOMPATIBLE ITEMS. DURING PEACETIME, THE INCOMPATIBLE ITEMS MUST BE TRANSPORTED SEPARATELY TO COMPLY WITH TITLE 49CFR. DURING TIMES OF DECLARED EMERGENCIES, INCOMPATIBLE LOADS MAY BE TRANSPORTED PROVIDING THEY MEET WITH THE REQUIREMENTS OF PROPER DOT EXEMPTION, E.G., DOT-E-3498.
- S. MANY OF THE LOADS CONTAINED HEREIN MAY BE OF A COMBAT CONFIGURED TYPE. SINCE SOME OF THESE COMBAT CONFIGURED LOADS CONTAIN SENSITIVE ITEMS IN SECURITY RISK CATEGORIES, TRANSPORT ON THESE OPEN FLATRACKS OVER CONUS RAIL OR HIGHWAY CANNOT BE ACCOMPLISHED WITHOUT AN APPROPRIATE SECURITY WAIVER, THEREBY ALLOWING DEVIATIONS FROM AR-55-355 AND DOD 5100.76-M REQUIREMENTS.

LOADING PROCEDURES:

1. PRIOR TO LOADING ITEMS ON THE FLATRACK ASSURE THAT THE DECK IS FREE OF EXCESSIVE AMOUNTS OF DIRT, SAND AND GRAVEL.
2. BEFORE LOADING A PLS FLATRACK WITH AMMUNITION OR EXPLOSIVES, CHECK THE OVERALL CONDITION OF THE FLATRACK TO ENSURE IT IS SERVICEABLE. CHECK FOR CRACKS, BREAKS, DISTORTIONS, OR EXCESSIVE CORROSION WHICH WOULD MAKE USE OF THE FLATRACK UNSAFE. CHECK THE CARGO TIEDOWN ANCHORS AND THE FLATRACK TIEDOWN DEVICES TO ENSURE THEY ARE SERVICEABLE. MAKE SURE THEY ARE NOT CRACKED, BROKEN, BENT, DISTORTED OR EXCESSIVELY CORRODED TO PRECLUDE SAFE USE. GIVE SPECIAL ATTENTION WHILE CHECKING THE LIFTING DEVICE ON THE HOOKUP END OF THE PLS FLATRACK. MAKE SURE THE HOOKUP DEVICE IS NOT CRACKED, BROKEN, WORN, OR DISTORTED TO SUCH AN EXTENT SO AS TO MAKE THE DEVICE UNSERVICEABLE OR UNSAFE TO USE.
3. IF APPLICABLE, CHECK THE END WALL ON THE M1 FLATRACK TO ASSURE THAT IT CAN BE RAISED AND/OR LOWERED WITHOUT DIFFICULTY. FOLLOW THE MANUFACTURER'S STEP-BY-STEP PROCEDURES FOR RAISING AND/OR LOWERING THE END WALL, AS SERIOUS INJURY OR DEATH TO PERSONNEL COULD RESULT DUE TO THE WEIGHT OF THE WALL.
4. BOTH FLATRACKS ARE EQUIPPED WITH ELEVEN TIEDOWN ANCHORS ALONG EACH SIDE. THE TIEDOWN ANCHORS AT EACH END AND IN THE CENTER HAVE A 25,000 POUND CAPACITY AND THE REMAINING EIGHT TIEDOWN ANCHORS HAVE A 10,000 POUND CAPACITY. ALL ELEVEN TIEDOWN ANCHORS WILL ACCEPT 2" STEEL STRAPPING. SEE THE STRAPPING DETAIL ON PAGE 56. NOTE THAT THE STAKE POCKETS ON THE M1077 FLATRACK MAY ALSO BE USED FOR 2" STEEL HOLD-DOWN STRAPPING. SEE THE STRAPPING DETAIL ON PAGE 57.
5. WHEN LOADING THE M1077 FLATRACK, POSITION LOADS TIGHT AGAINST THE A-FRAME AT THE FORWARD END. LOADS OF 155MM AND/OR 8-INCH SEPARATE LOADING PROJECTILES MUST BE DIVIDED INTO SECTIONS WHICH MUST NOT EXCEED 11,000 POUNDS EACH, SEE THE LOADS ON PAGES 22 AND 28 FOR GUIDANCE. LOADS OF PALLETIZED UNITS, OTHER THAN SEPARATE LOADING PROJECTILES, HAVING A TOTAL WEIGHT OF 16,500 POUNDS OR MORE, MUST BE DIVIDED INTO TWO SECTIONS. SEE THE LOAD ON PAGE 24 FOR GUIDANCE.
6. WHEN LOADING THE M1 FLATRACK, POSITION THE LOAD TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER. SEE THE LOADS ON PAGES 4 THROUGH 21 FOR GUIDANCE.
7. TO ASSURE A TIGHT LOAD, ALL PALLET UNITS AND/OR OTHER ITEMS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY AS LOADING PROGRESSES.
8. PRIOR TO LOADING THE FLATRACK, DETERMINE THE QUANTITY OF PALLETIZED/SKIDDED UNIT(S) TO BE LOADED, SELECT THE BEST METHOD OF SECURING THE UNIT(S) FROM THE METHODS SHOWN WITHIN THIS DRAWING. NOTE: A COMBINATION OF THE METHODS SHOWN WITHIN THIS DRAWING MAY BE USED ON THE SAME FLATRACK.
9. THIS PROCEDURAL DRAWING INCLUDES PROCEDURES FOR BOTH PALLETIZED UNITS AND SKIDDED UNITS. THE GUIDANCE SHOWN FOR ONE TYPE OF UNIT MAY ALSO BE USED FOR THE OTHER TYPE OF UNIT.
10. TWO SETS OF FORKLIFT POCKETS ARE PROVIDED UNDERNEATH THE M1077 AND M1 FLATRACKS. THE SET NEAR THE ENDS OF THE FLATRACK MUST BE USED WHEN LIFTING LOADED FLATRACKS. THE SET CLOSEST TO THE CENTER OF THE FLATRACK IS FOR LIFTING UNLOADED FLATRACKS ONLY. USE OF THE WRONG FORKLIFT POCKETS COULD CAUSE DAMAGE TO EQUIPMENT. THE FORKS ON THE FORKLIFT MUST BE AT LEAST 70.00' LONG.

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ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE ASSEMBLY A (1 REQD). POSITION AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 36.
- ② CENTER GATE ASSEMBLY B (1 REQD). POSITION AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 36.
- ③ STRUT, 2" X 6" BY CUT-FOR-WEDGE-FIT (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO PIECES MARKED ① AND ② W/2-12d NAILS AT EACH END. NAIL THE SECOND PIECE TO THE FIRST PIECE W/3-10d NAILS AND TOENAIL TO PIECES MARKED ① AND ② W/2-12d NAILS AT EACH END. SEE GENERAL NOTE "N" ON PAGE 2.
- ④ HOLD-DOWN, 2" X 4" BY LENGTH-TO-SUIT (1 REQD). POSITION ON JOINTS BETWEEN PALLETS AT LOCATION SHOWN.
- ⑤ HOLD-DOWN ASSEMBLY B (2 REQD). POSITION ON TOP OF THE SEPARATE LOADING PROJECTILE PALLETS AS SHOWN. SEE DETAIL ON PAGE 46.
- ⑥ STRAPPING BOARD ASSEMBLY A (8 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO PIECE MARKED ④ W/2-10d NAILS EACH JOINT. SEE THE DETAIL ON PAGE 44.
- ⑦ HOLD-DOWN ASSEMBLY A (2 REQD). POSITION ON TOP OF THE PROPELLING CHARGE PALLETS AS SHOWN. SEE DETAIL ON PAGE 46.
- ⑧ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑭. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2, AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.

(KEY NUMBERS CONTINUED ON PAGE 5)

8-INCH COMBAT CONFIGURED LOAD				
DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
D662	PROP CHG. 8-INCH 52.50 L X 40.75 W X 48.50 H	80	4 PALLETS	6,952 LBS
D624	PROJ. 8-INCH, M650 19.37 L X 28.50 W X 45.62 H	72	12 PALLETS	15,036 LBS
N340	FUZE, M739 14.63 L X 12.81 W X 8.56 H	32	2 BOXES	92 LBS
N463	FUZE, M728 14.63 L X 12.75 W X 12.00 H	48	3 BOXES	142 LBS
N523	PRIMER, M82 24.13 L X 12.00 W X 11.25 H	500	1 BOX	37 LBS

SPECIAL NOTES:

1. A TYPICAL 8-INCH COMBAT CONFIGURED LOAD FOR FIELD ARTILLERY IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE 8-INCH COMBAT CONFIGURED LOAD SHOWN IN THE CHART ON PAGE 4 IS SHOWN AS TYPICAL. IF LOADING PALLETS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETS ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE PALLETS TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.
6. WHEN POSITIONING LOOSE BOXES ON TOP OF A LOAD, POSITION THE BOXES BETWEEN TWO STRAPPING BOARD ASSEMBLIES WHEN POSSIBLE. THIS WILL HELP PROVIDE LONGITUDINAL SUPPORT ALONG WITH THE LOOSE BOX HOLD-DOWN STRAPS.
7. FOR THE SAME COMBAT CONFIGURED LOAD ON THE M1077 FLATRACK, SEE PAGES 22 AND 23.

(KEY NUMBERS CONTINUED FROM PAGE 4)

- ⑨ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (3 REQD). INSTALL EACH STRAP TO ENCIRCLE ALL FOUR Laterally ADJACENT PALLET UNITS, UNDER THE SKID BASE AND OVER TOP OF COVER. POSITION STRAPS AT CENTER OF PALLETS. SEAL EACH STRAP WITH ONE SEAL MARKED ⑤. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑩ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE THE D662 PROPELLING CHARGE PALLET (THREAD STRAPS UNDER TOP DECK OF PALLET BASE) AND THE TWO LOOSE N340 FUZE BOXES AS SHOWN. SEAL EACH STRAP WITH ONE SEAL MARKED ⑥. NOTE THAT THESE STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLET. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑪ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE THE D662 PROPELLING CHARGE PALLET (THREAD STRAPS UNDER TOP DECK OF PALLET BASE) AND THE LOOSE N523 BOX OF PRIMERS AS SHOWN. SEAL EACH STRAP WITH ONE SEAL MARKED ⑥. NOTE THAT THESE STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLET. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑫ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE THE D662 PROPELLING CHARGE PALLETS (THREAD STRAPS UNDER TOP DECK OF PALLET BASE) AND THE TWO LOOSE N463 FUZE BOXES AS SHOWN. SEAL EACH STRAP WITH ONE SEAL MARKED ⑥. NOTE THAT THESE STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLET. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑬ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE THE D662 PROPELLING CHARGE PALLET (THREAD STRAPS UNDER TOP DECK OF PALLET BASE) AND THE LOOSE N463 FUZE BOX AS SHOWN. SEAL EACH STRAP WITH ONE SEAL MARKED ⑥. NOTE THAT THESE STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLET. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑭ SEAL FOR 2" STEEL STRAPPING (32 REQD). FOUR SEALS FOR EACH STRAP MARKED ⑧. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑮ SEAL FOR 1-1/4" STEEL STRAPPING (3 REQD). ONE SEAL FOR EACH STRAP MARKED ⑨. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑯ SEAL FOR 3/4" STEEL STRAPPING (8 REQD). ONE SEAL FOR EACH STRAP MARKED ⑩, ⑪, ⑫ AND ⑬. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.

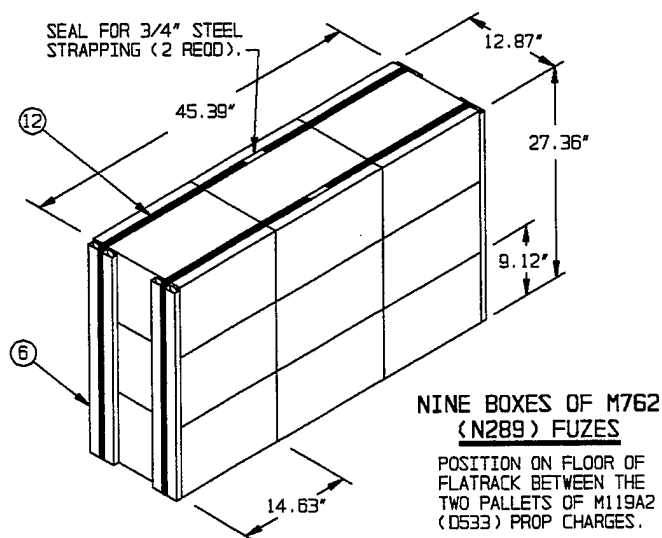
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	20	7
2" X 4"	141	94
2" X 6"	135	135
NAILS	NO. REQD	POUNDS
10d (3")	227	3-1/2
12d (3-1/4")	32	1/2
STEEL STRAPPING, 2" - - - - -164' REQD - - - - - 55 LBS		
STEEL STRAPPING, 1-1/4" - - - - - 68' REQD - - - - - 10 LBS		
STEEL STRAPPING, 3/4" - - - - -150' REQD - - - - - 11 LBS		
SEAL FOR 2" STRAPPING - - - - - 32 REQD - - - - - 7 LBS		
SEAL FOR 1-1/4" STRAPPING - - - 3 REQD - - - - - NIL		
SEAL FOR 3/4" STRAPPING - - - 8 REQD - - - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
8-INCH CCL - - - - -	1 - - - - -	22,259 LBS
DUNNAGE - - - - -	- - - - -	559 LBS
TOTAL WEIGHT - - - - -		22,818 LBS

SPECIAL NOTES:

1. A TYPICAL 155MM COMBAT CONFIGURED LOAD FOR FIELD ARTILLERY IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE 155MM COMBAT CONFIGURED LOAD SHOWN IN THE CHART ON PAGE 6 IS SHOWN AS TYPICAL. IF LOADING PALLETS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE PALLETS TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.
6. WHEN POSITIONING LOOSE BOXES ON TOP OF A LOAD, POSITION THE BOXES BETWEEN TWO STRAPPING BOARD ASSEMBLIES WHEN POSSIBLE. THIS WILL HELP PROVIDE LONGITUDINAL SUPPORT ALONG WITH THE LOOSE BOX HOLD-DOWN STRAPS.
7. THE METHOD SHOWN FOR STRAPPING LOOSE BOXES ON TOP OF PALLET UNITS IS AN ALTERNATIVE METHOD. IF DESIRED BOTH STRAPS MAY BE POSITIONED IN A LONGITUDINAL DIRECTION AS SHOWN IN THE LOAD ON PAGE 4.



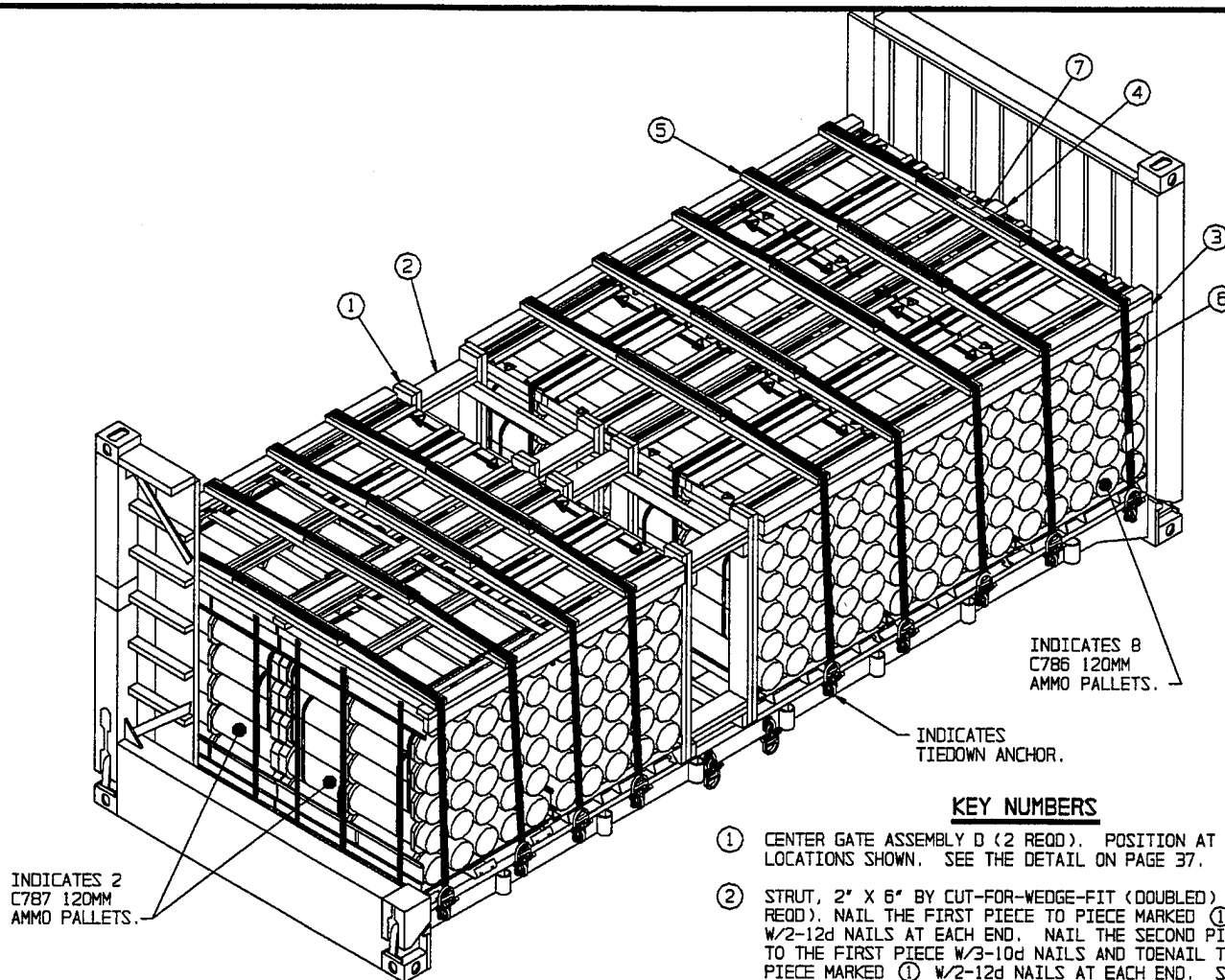
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	20	7
2" X 2"	9	3
2" X 4"	188	126
2" X 6"	44	44
NAILS	NO. REQD	POUNDS
10d (3")	224	3-1/2
STEEL STRAPPING, 2" - - - - 198' REQD - - - - 66 LBS		
STEEL STRAPPING, 1-1/4" - - - 96' REQD - - - - 14 LBS		
STEEL STRAPPING, 3/4" - - - - 142' REQD - - - - 11 LBS		
SEAL FOR 2" STRAPPING - - - - 36 REQD - - - - 8 LBS		
SEAL FOR 1-1/4" STRAPPING - - - 4 REQD - - - - NIL		
SEAL FOR 3/4" STRAPPING - - - - 8 REQD - - - - NIL		

(KEY NUMBERS CONTINUED FROM PAGE 6)

- ⑫ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (4 REQD). INSTALL EACH STRAP TO ENCIRCLE ALL Laterally ADJACENT PALLET UNITS UNDER THE SKID BASE AND OVER TOP OF COVER. POSITION STRAPS AT CENTER OF PALLETS. SEAL WITH ONE SEAL MARKED ⑪. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑬ BUNDLING STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE NINE BOXES OF M762 (N289) FUZES AND FILL PIECES MARKED ⑥. SEAL EACH STRAP WITH ONE SEAL MARKED ⑬. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑭ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE THE D533 PROPELLING CHARGE PALLET (THREAD STRAP UNDER TOP DECK OF PALLET BASE) AND THE LOOSE N523 BOX OF PRIMERS AS SHOWN. ONE STRAP ENCIRCLES PALLET AND PRIMER BOX Laterally AND ONE STRAP ENCIRCLES PALLET AND PRIMER BOX LONGITUDINALLY. SEAL EACH STRAP WITH ONE SEAL MARKED ⑭. NOTE THAT THESE STRAPS MUST BE PREPOSITIONED PRIOR TO POSITIONING PALLET. SEE SPECIAL NOTE 7 ON THIS PAGE AND GENERAL NOTE "M" ON PAGE 2.
- ⑮ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE THE D541 PROPELLING CHARGE PALLET (THREAD STRAP UNDER TOP OF DECK OF PALLET BASE) AND THE N340 FUZE BOX AS SHOWN. ONE STRAP ENCIRCLES PALLET AND FUZE BOX Laterally AND ONE STRAP ENCIRCLES PALLET AND FUZE BOX LONGITUDINALLY. SEAL EACH STRAP WITH ONE SEAL MARKED ⑮. NOTE THAT THESE STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLET. SEE SPECIAL NOTE 7 ON THIS PAGE AND GENERAL NOTE "M" ON PAGE 2.
- ⑯ SEAL FOR 2" STEEL STRAPPING (36 REQD). FOUR SEALS FOR EACH STRAP MARKED ⑫. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑰ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑱ SEAL FOR 3/4" STEEL STRAPPING (8 REQD). ONE SEAL FOR EACH STRAP MARKED ⑬, ⑭, ⑮ AND ⑯. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
155MM CCL - - - - -	1 - - - - -	25,779 LBS
DUNNAGE - - - - -	- - - - -	463 LBS
TOTAL WEIGHT - - - - -		26,242 LBS



INDICATES 2
C787 120MM
AMMO PALLETS.

INDICATES 8
C786 120MM
AMMO PALLETS.

INDICATES
TIEDOWN ANCHOR.

AFT END.

ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE ASSEMBLY D (2 REQD). POSITION AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 37.
- ② STRUT, 2" X 6" BY CUT-FOR-WEDGE-FIT (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO PIECE MARKED ① W/2-12d NAILS AT EACH END. NAIL THE SECOND PIECE TO THE FIRST PIECE W/3-10d NAILS AND TOENAIL TO PIECE MARKED ① W/2-12d NAILS AT EACH END. SEE GENERAL NOTE "N" ON PAGE 2.
- ③ HOLD-DOWN ASSEMBLY A (4 REQD). POSITION ON TOP OF THE PALLETS AS SHOWN. SEE THE DETAIL ON PAGE 46.
- ④ HOLD-DOWN, 2" X 4" BY LENGTH-TO SUIT (2 REQD). POSITION ON JOINTS BETWEEN PALLETS AT LOCATIONS SHOWN.
- ⑤ STRAPPING BOARD ASSEMBLY A (9 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO THE HOLD-DOWN PIECES MARKED ④ W/2-10d NAILS AT EACH JOINT. SEE THE DETAIL ON PAGE 44.
- ⑥ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (9 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑦. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2, AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ⑦ SEAL FOR 2" STEEL STRAPPING (36 REQD). FOUR SEALS FOR EACH STRAP MARKED ⑥. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

120MM COMPLETE ROUND CONFIGURED LOAD

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
C786	CTG, 120MM M829 39.50 L X 44.50 W X 51.50 H	240	8 PALLETS	19,128 LBS
C787	CTG, 120MM M830 40.13 L X 44.50 W X 51.75 H	60	2 PALLETS	4,866 LBS

120MM ARMOR COMBAT CONFIGURED LOAD

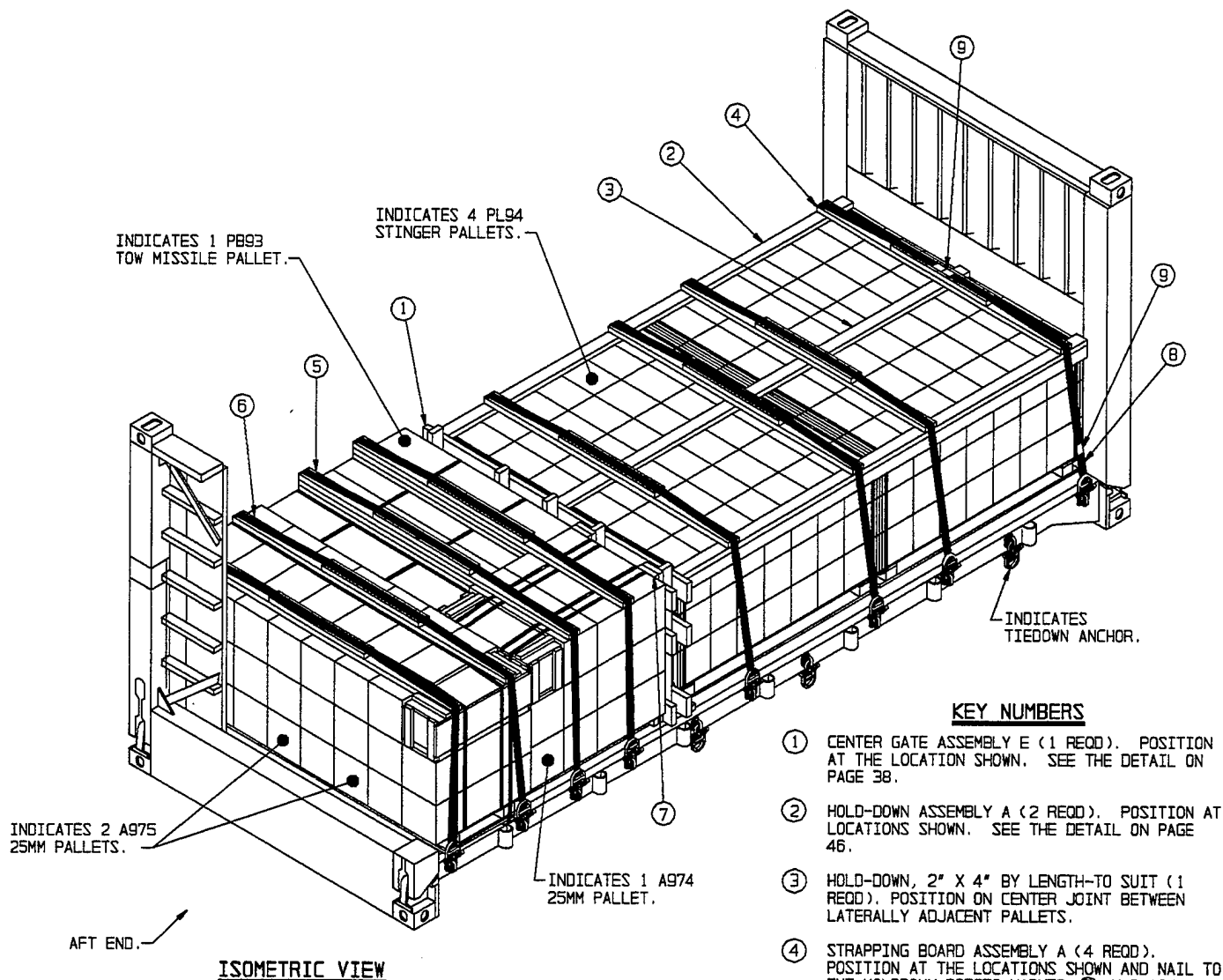
SPECIAL NOTES:

1. A TYPICAL 120MM ARMOR COMBAT CONFIGURED LOAD IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE 120MM COMBAT CONFIGURED LOAD SHOWN IN THE CHART ON PAGE 8 IS SHOWN AS TYPICAL. IF LOADING PALLETS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE 120MM PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE PALLETS TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.
6. FOR THE SAME COMBAT CONFIGURED LOAD ON THE M1077 FLATRACK, SEE PAGES 24 AND 25.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	166	111
2" X 6"	130	130
NAILS	NO. REQD	POUNDS
10d (3")	223	3-1/4
12d (3-1/4")	64	1-1/4
STEEL STRAPPING, 2" - - - - 198' REQD - - - - 66 LBS		
SEAL FOR 2" STRAPPING - - - - 36 REQD - - - - 8 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
120MM CCL	1	23,994 LBS
DUNNAGE		561 LBS
TOTAL WEIGHT		24,555 LBS



ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE ASSEMBLY E (1 REQD). POSITION AT THE LOCATION SHOWN. SEE THE DETAIL ON PAGE 38.
- ② HOLD-DOWN ASSEMBLY A (2 REQD). POSITION AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 46.
- ③ HOLD-DOWN, 2" X 4" BY LENGTH-TO SUIT (1 REQD). POSITION ON CENTER JOINT BETWEEN LATERALLY ADJACENT PALLETS.
- ④ STRAPPING BOARD ASSEMBLY A (4 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO THE HOLD-DOWN PIECES MARKED ③ W/2-10d NAILS AT EACH END. SEE THE DETAIL ON PAGE 44.
- ⑤ STRAPPING BOARD ASSEMBLY D (2 REQD). POSITION AT THE LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑥ STRAPPING BOARD ASSEMBLY C (2 REQD). POSITION AT THE LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑦ SOLID FILL, 2" X 6" X 42-1/2" (DOUBLED) (2 REQD). CENTER ON THE VERTICAL PIECES ON THE CENTER GATE ASSEMBLY AND NAIL FIRST PIECE TO THE LOAD BEARING PIECES ON THE CENTER GATE W/3-10d NAILS AT EACH JOINT. NAIL SECOND PIECE TO THE FIRST PIECE W/7-10d NAILS.
- ⑧ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑨. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2, AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ⑨ SEAL FOR 2" STEEL STRAPPING (32 REQD). FOUR SEALS FOR EACH STRAP MARKED ⑧. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

COMBAT CONFIGURED LOAD FOR AIR DEFENSE ARTILLERY

DDIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
PL94	STINGER RMP, FIM 92C 39.37 L X 67.25 W X 36.50 H	36	4 PALLETS	2,996 LBS
PB93	TOW IIA BGM-71D 48.00 L X 58.25 W X 39.75 H	12	1 PALLET	1,127 LBS
A974	25MM CARTRIDGE, APDS-T, M791 31.50 L X 45.00 W X 42.50 H	600	1 PALLET	1,241 LBS
A975	25MM CARTRIDGE, HEI-T, M792 31.50 L X 45.00 W X 42.50 H	1,200	2 PALLETS	2,482 LBS

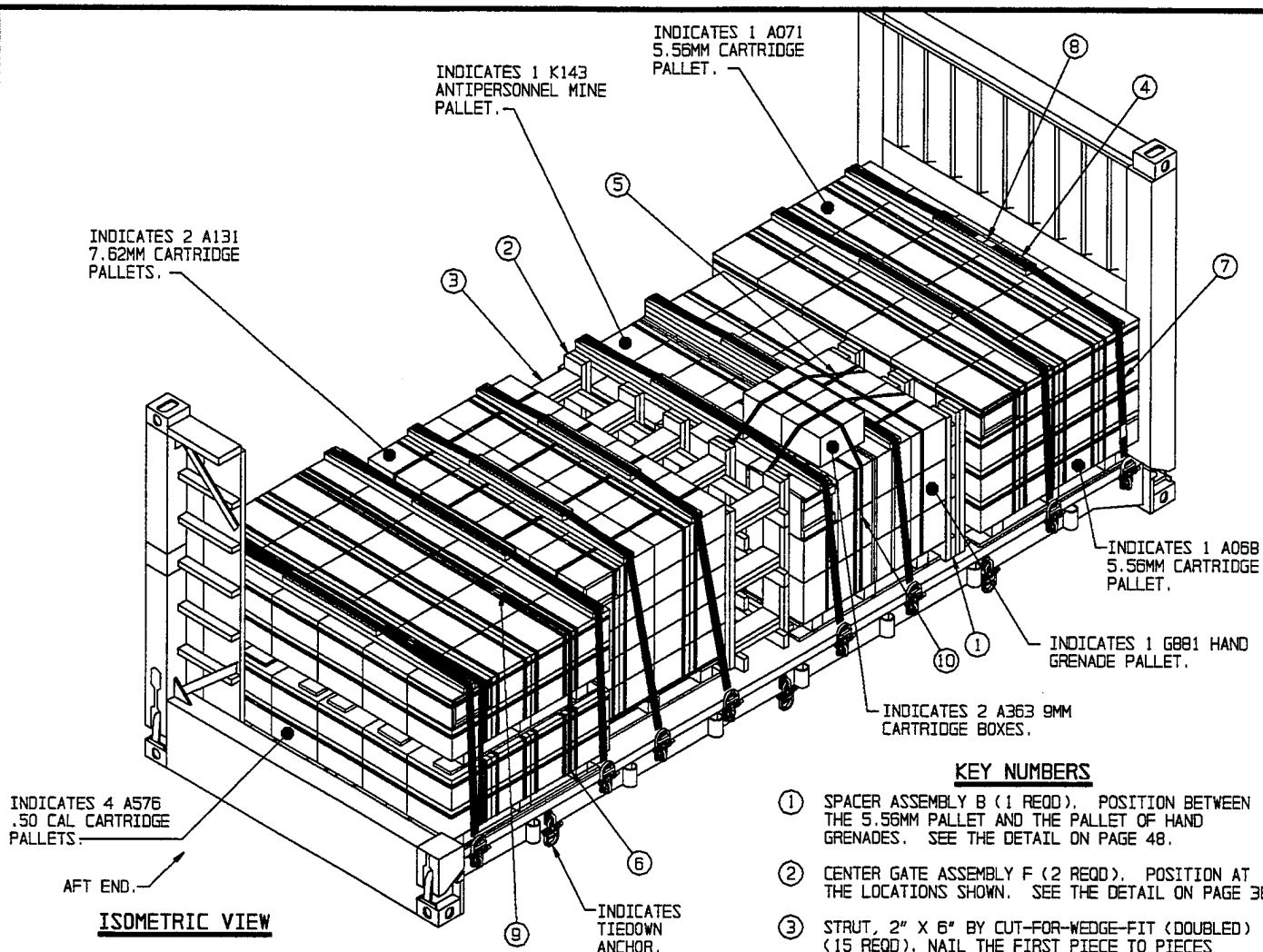
SPECIAL NOTES:

1. A TYPICAL COMBAT CONFIGURED LOAD FOR AIR DEFENSE ARTILLERY IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE COMBAT CONFIGURED LOAD SHOWN IN THE CHART ON PAGE 10 IS SHOWN AS TYPICAL. IF LOADING PALLETS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE PALLETS TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.
6. FOR THE SAME COMBAT CONFIGURED LOAD ON THE M1077 FLATRACK, SEE PAGES 26 AND 27.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	145	97
2" X 6"	81	81
NAILS	NO. REQD	POUNDS
10d (3")	206	3-1/4
STEEL STRAPPING, 2" - - - - 164' REQD - - - - 55 LBS		
SEAL FOR 2" STRAPPING - - - - 32 REQD - - - - 5 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CCL - - - - -	1 - - - - -	7,846 LBS
DUNNAGE - - - - -	- - - - -	420 LBS
TOTAL WEIGHT - - - - -		8,266 LBS



ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

- ⑧ SEAL FOR 2" STEEL STRAPPING (32 REQD). FOUR SEALS FOR EACH STRAP MARKED ⑧. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑨ SEAL FOR 1-1/4" STEEL STRAPPING (2 REQD). ONE SEAL FOR EACH STRAP MARKED ⑨. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑩ SEAL FOR 3/4" STEEL STRAPPING (3 REQD). ONE SEAL FOR EACH STRAP MARKED ⑩. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.

KEY NUMBERS

- ① SPACER ASSEMBLY B (1 REQD). POSITION BETWEEN THE 5.56MM PALLET AND THE PALLET OF HAND GRENADES. SEE THE DETAIL ON PAGE 48.
- ② CENTER GATE ASSEMBLY F (2 REQD). POSITION AT THE LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 38.
- ③ STRUT, 2" X 6" BY CUT-FOR-WEDGE-FIT (DOUBLED) (15 REQD). NAIL THE FIRST PIECE TO PIECES MARKED ② W/2-12d NAILS AT EACH END. NAIL THE SECOND PIECE TO THE FIRST PIECE W/3-10d NAILS AND TOENAIL TO PIECE MARKED ② W/2-12d NAILS AT EACH END. SEE GENERAL NOTE "N" ON PAGE 2.
- ④ STRAPPING BOARD ASSEMBLY C (8 REQD). POSITION AT THE LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑤ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (3 REQD). INSTALL EACH STRAP TO ENCIRCLE THE G881 GRENADE PALLET (THREAD STRAPS UNDER TOP DECK OF PALLET BASE) AND THE TWO LOOSE A363 9MM BOXES AS SHOWN. ONE STRAP ENCIRCLES PALLET AND BOTH 9MM BOXES LATERALLY AND TWO STRAPS ENCIRCLE THE PALLET AND 9MM BOXES LONGITUDINALLY. SEAL EACH STRAP WITH ONE SEAL MARKED ⑩. NOTE THAT THESE STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLET. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE ALL FOUR .50 CAL A576 PALLETS AT LOCATIONS SHOWN. SEAL EACH STRAP WITH ONE SEAL MARKED ⑨. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑦ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑧. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2, AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.

SMALL ARMS COMBAT CONFIGURED LOAD

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
A131	7.62MM CARTRIDGE 46.00 L X 35.00 W X 46.12 H	64,000	2 PALLETS	6,362 LBS
A068	5.56MM CARTRIDGE 51.00 L X 43.50 W X 39.00 H	78,720	1 PALLET	3,016 LBS
A071	5.56MM CARTRIDGE 51.00 L X 43.50 W X 39.00 H	80,640	1 PALLET	3,388 LBS
A576	.50 CAL CARTRIDGE 51.00 L X 43.50 W X 22.25 H	19,200	4 PALLETS	7,736 LBS
G881	HAND GRENADE 45.75 L X 37.87 W X 39.25 H	720	1 PALLET	1,309 LBS
K143	MINE, ANTIPERSONNEL 53.50 L X 42.25 W X 35.75 H	192	1 PALLET	1,808 LBS
A363	9MM CARTRIDGE 14.43 L X 12.53 W X 8.12 H	4,000	2 BOXES	160 LBS

(CONTINUED AT LEFT)

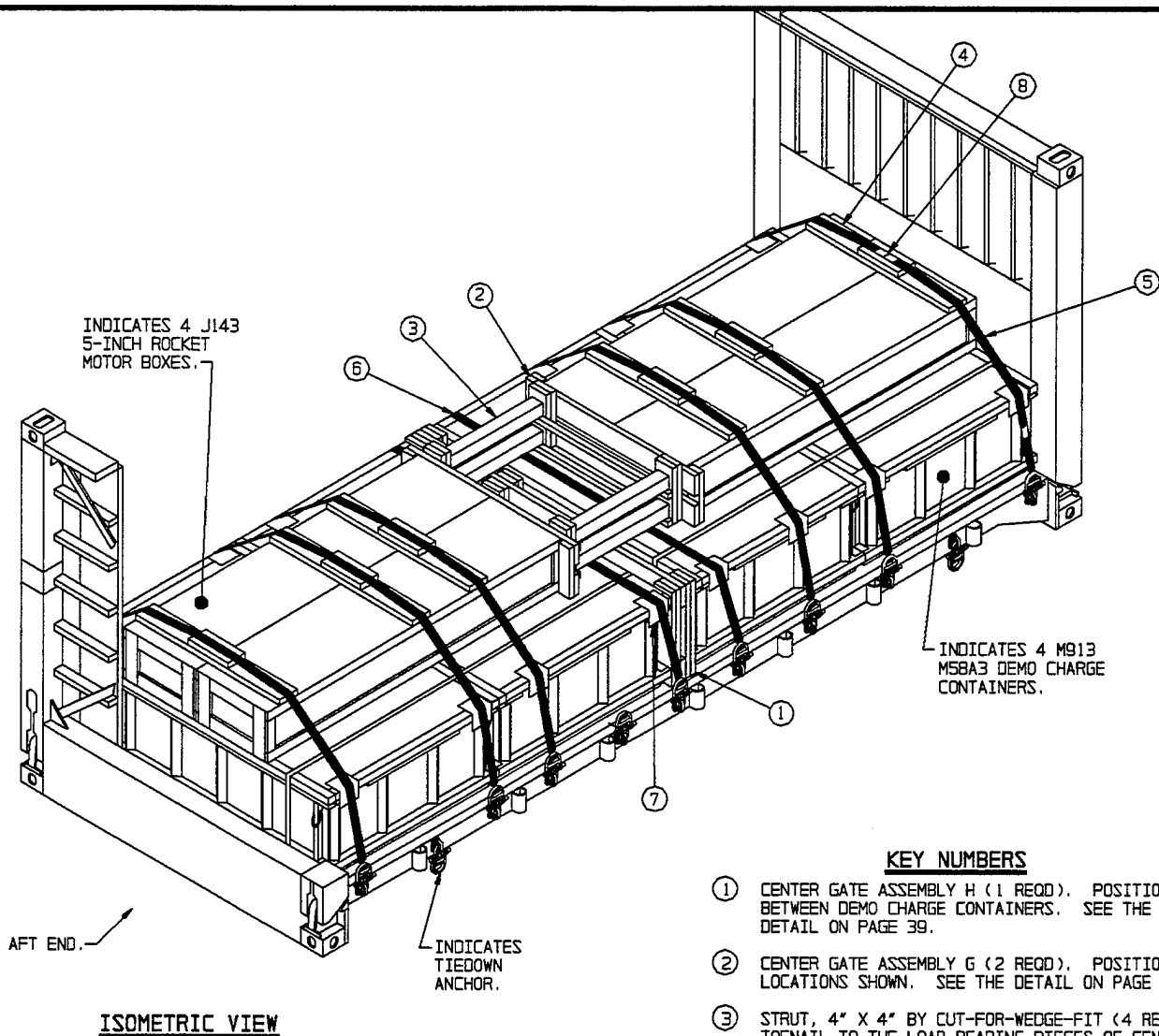
SPECIAL NOTES:

1. A TYPICAL SMALL ARMS COMBAT CONFIGURED LOAD FOR INFANTRY IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE SMALL ARMS AMMO COMBAT CONFIGURED LOAD SHOWN IN THE CHART ON PAGE 12 IS SHOWN AS TYPICAL. IF LOADING PALLETS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHT, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE PALLETS TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.
6. WHEN POSITIONING LOOSE BOXES ON TOP OF A LOAD, CENTER THE BOXES BETWEEN TWO STRAPPING BOARD ASSEMBLIES AS SHOWN. THIS WILL HELP PROVIDE LONGITUDINAL SUPPORT ALONG WITH THE LOOSE HOLD-DOWN STRAPS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	12	4
2" X 4"	118	73
2" X 6"	147	147
NAILS	NO. REQD	POUNDS
10d (3")	316	5
12d (3-1/4")	120	2
STEEL STRAPPING, 2" - - - - 164' REQD - - - - 55 LBS		
STEEL STRAPPING, 1-1/4" - - 49' REQD - - - - 7 LBS		
STEEL STRAPPING, 3/4" - - - 48' REQD - - - - 4 LBS		
SEAL FOR 2" STRAPPING - - - - 32 REQD - - - - 7 LBS		
SEAL FOR 1-1/4" STRAPPING - - 2 REQD - - - - NIL		
SEAL FOR 3/4" STRAPPING - - - - 3 REQD - - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SMALL ARMS CCL - - - - - 1 - - - - -		23,779 LBS
DUNNAGE - - - - -		528 LBS
TOTAL WEIGHT - - - - -		24,307 LBS



ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE ASSEMBLY H (1 REQD). POSITION BETWEEN DEMO CHARGE CONTAINERS. SEE THE DETAIL ON PAGE 39.
- ② CENTER GATE ASSEMBLY G (2 REQD). POSITION AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 39.
- ③ STRUT, 4" X 4" BY CUT-FOR-WEDGE-FIT (4 REQD). TOENAIL TO THE LOAD BEARING PIECES OF CENTER GATE ASSEMBLY G W/2-16d NAILS AT EACH END.
- ④ STRAPPING BOARD ASSEMBLY C (6 REQD). POSITION AT THE LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑤ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (6 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑧. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑥ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF DEMO CONTAINER AND SEAL WITH TWO SEALS MARKED ⑧. SEE GENERAL NOTE "L" ON PAGE 2, AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ⑦ EDGE PROTECTOR, STEEL, FOR 2" STEEL STRAPPING (16 REQD). POSITION UNDER STRAPS MARKED ⑤ AND ⑥ AT EDGE OF DEMO CONTAINERS.
- ⑧ SEAL FOR 2" STEEL STRAPPING (32 REQD) FOUR SEALS FOR EACH STRAP MARKED ⑤ AND ⑥. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

MS8A3 LINEAR DEMOLITION CHARGE (MICLIC) CCL

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
M913	DEMO CHARGE MS8A3 83.25 L X 53.75 W X 24.75 H	4	4 CNTRS	11,600 LBS
J143	5-INCH ROCKET MOTOR 92.50 L X 22.50 W X 13.50 H	4	4 BOXES	800 LBS

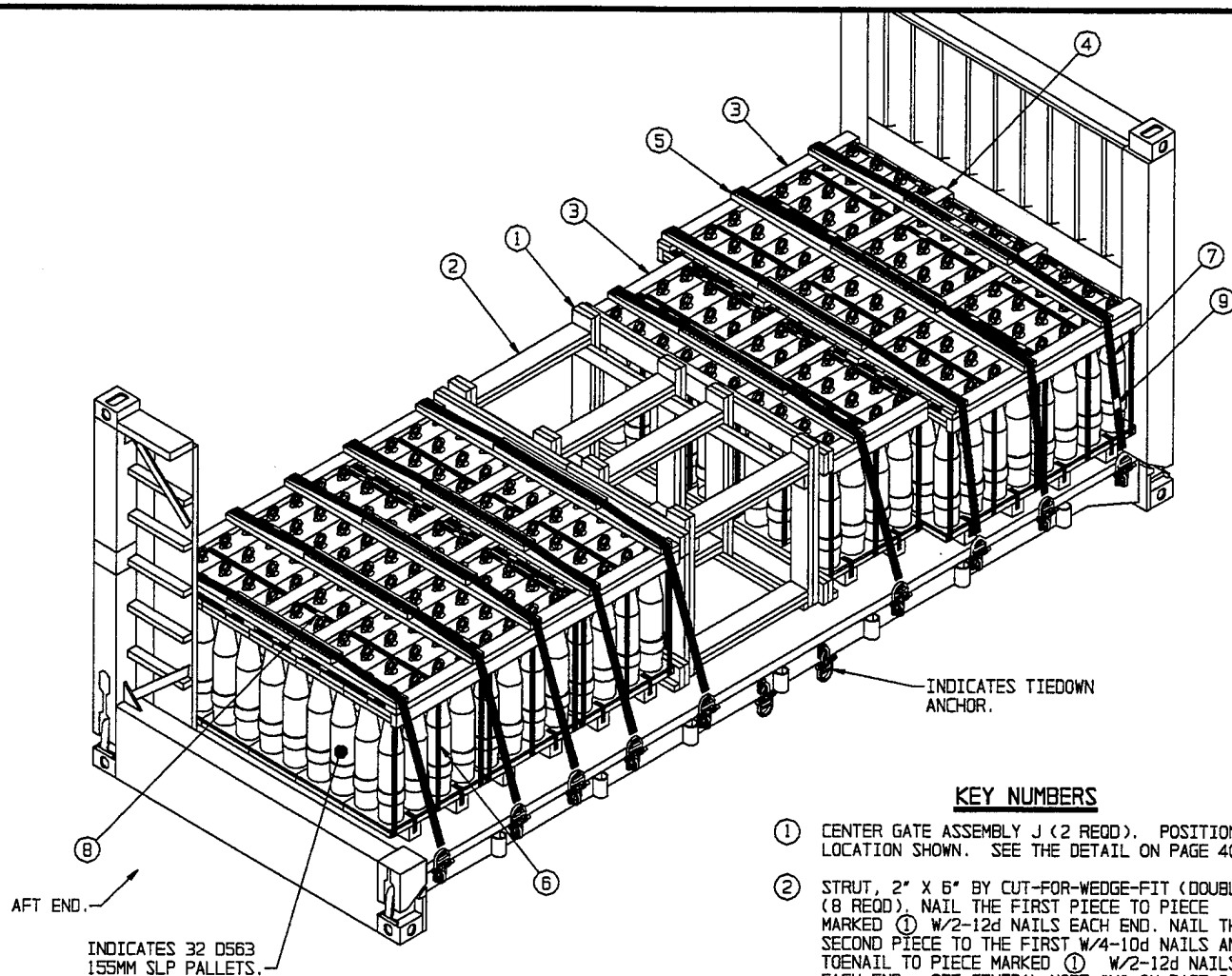
SPECIAL NOTES:

1. A TYPICAL MICLIC DEMOLITION CHARGE COMBAT CONFIGURED LOAD FOR ENGINEERS IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE MICLIC MS8A3 DEMOLITION CHARGE IN METAL CONTAINERS AND THE ROCKET MOTOR IN WOODEN BOXES IN THE LOAD ON PAGE 14 ARE SHOWN AS TYPICAL. IF LOADING SIMILAR TYPE CONTAINERS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE CONTAINERS, ASSURE THAT ALL STEEL STRAPPING ON EACH CONTAINER IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE DEMOLITION CHARGE CONTAINERS AND ROCKET MOTOR BOXES TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL CONTAINERS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	15	5
2" X 4"	43	29
2" X 6"	75	75
4" X 4"	10	14
NAILS	NO. REQD	POUNDS
10d (3")	204	3-1/4
16d (3-1/2")	16	1/2
STEEL STRAPPING, 2"	164' REQD	55 LBS
SEAL FOR 2" STRAPPING	32 REQD	-7 LBS
EDGE PROTECTORS	AS REQD	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DEMO CHARGE MS8A3	4	11,600 LBS
5-INCH ROCKET MOTOR	4	800 LBS
DUNNAGE		312 LBS
TOTAL WEIGHT		12,712 LBS



ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE ASSEMBLY J (2 REQD). POSITION AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 40.
- ② STRUT, 2" X 6" BY CUT-FOR-WEDGE-FIT (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO PIECE MARKED ① W/2-12d NAILS EACH END. NAIL THE SECOND PIECE TO THE FIRST W/4-10d NAILS AND TOENAIL TO PIECE MARKED ① W/2-12d NAILS EACH END. SEE GENERAL NOTE "N" ON PAGE 2.
- ③ HOLD-DOWN ASSEMBLY B (6 REQD). POSITION ON TOP OF THE PALLETS AS SHOWN. SEE THE DETAIL ON PAGE 46.
- ④ HOLD-DOWN, 2" X 4" BY LENGTH-TO-SUIT (6 REQD). POSITION ON JOINTS BETWEEN PALLETS AT LOCATIONS SHOWN.
- ⑤ STRAPPING BOARD ASSEMBLY A (9 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO THE HOLD-DOWN PIECES MARKED ④ W/2-10d NAILS EACH JOINT. SEE THE DETAIL ON PAGE 44.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (6 REQD). INSTALL EACH STRAP TO ENCIRCLE ALL LATERALLY ADJACENT PALLET UNITS UNDER THE SKID BASE AND OVER TOP OF COVER. POSITION STRAPS AT CENTER OF PALLETS. SEAL EACH STRAP WITH ONE SEAL MARKED ⑧. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑦ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (9 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS PIECES MARKED ⑨. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2, AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ⑧ SEAL FOR 1-1/4" STEEL STRAPPING (6 REQD) ONE SEAL FOR EACH STRAP MARKED ⑥, DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑨ SEAL FOR 2" STEEL STRAPPING (36 REQD) FOUR SEALS FOR EACH STRAP MARKED ⑦, DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

TYPICAL AMMUNITION ITEM

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
D563	PROJ, 155MM, 483A1 OPICM 14.62 L X 29.12 W X 39.38 H	256	32 PALLETS	27,968 LBS

155MM SEPARATE LOADING PROJECTILES

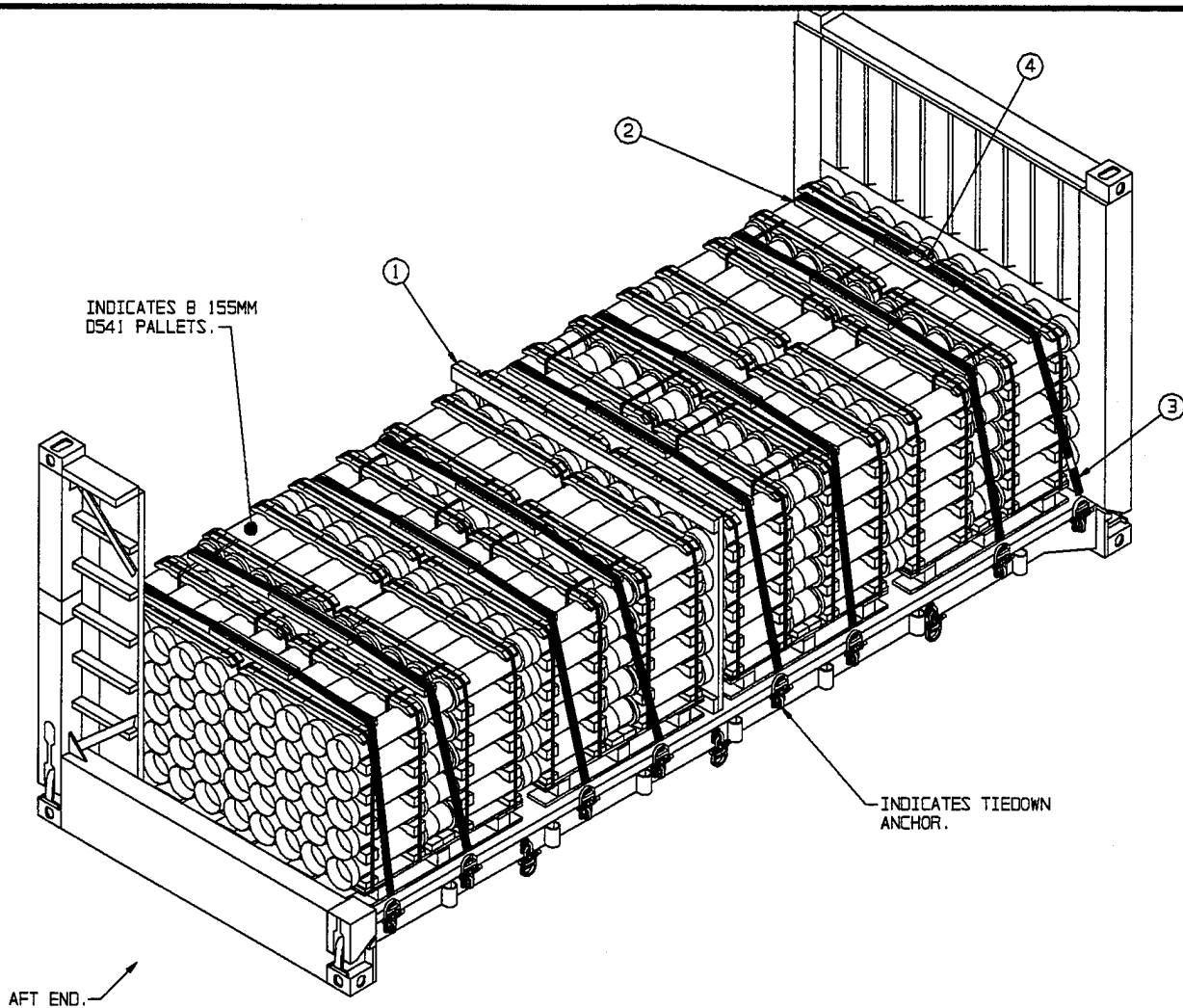
SPECIAL NOTES:

1. A TYPICAL LOAD OF 32 PALLETS OF 155MM SEPARATE LOADING PROJECTILES IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE 155MM SLP PALLET HAVING DIMENSIONS OF 29-1/8" WIDE BY 14-5/8" LONG BY 39-3/8" HIGH AND WEIGHING 874 POUNDS IS SHOWN AS TYPICAL. IF LOADING SLP PALLETS OF OTHER QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE SLP PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE PALLETS TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.
6. FOR THE SAME ITEM ON THE M1077 FLATRACK, SEE PAGES 28 AND 29.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	13	5
2" X 4"	176	118
2" X 6"	100	100
NAILS	NO. REQD	POUNDS
10d (3")	205	3-1/4
12d (3-1/4")	32	3/4
STEEL STRAPPING, 1-1/4" - - - 138' REQD - - - - 20 LBS		
STEEL STRAPPING, 2" - - - - 216' REQD - - - - 72 LBS		
SEAL FOR 1-1/4" STRAPPING - - 6 REQD - - - 1/4 LB		
SEAL FOR 2" STRAPPING - - - - 36 REQD - - - 7-1/2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
155MM SLP PALLET - - - -	32 - - - -	27,968 LBS
DUNNAGE - - - - -	- - - - -	550 LBS
TOTAL WEIGHT - - - - -		28,518 LBS



ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE ASSEMBLY K (1 REOD). POSITION AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 40.
- ② STRAPPING BOARD ASSEMBLY E (8 REOD). POSITION AT THE LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ③ HOLD-DOWN STRAP, 2" X .044" OR .50" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REOD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ④. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ④ SEAL FOR 2" STEEL STRAPPING (32 REOD). FOUR SEALS FOR EACH STRAP MARKED ③, DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

TYPICAL AMMUNITION ITEMS

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
0541	PROP CHARGE, 155MM M4 55.00 L X 40.00 W X 44.88 H	400	8 PALLETS	14,128 LBS

155MM PROPELLING CHARGE CONTAINERS

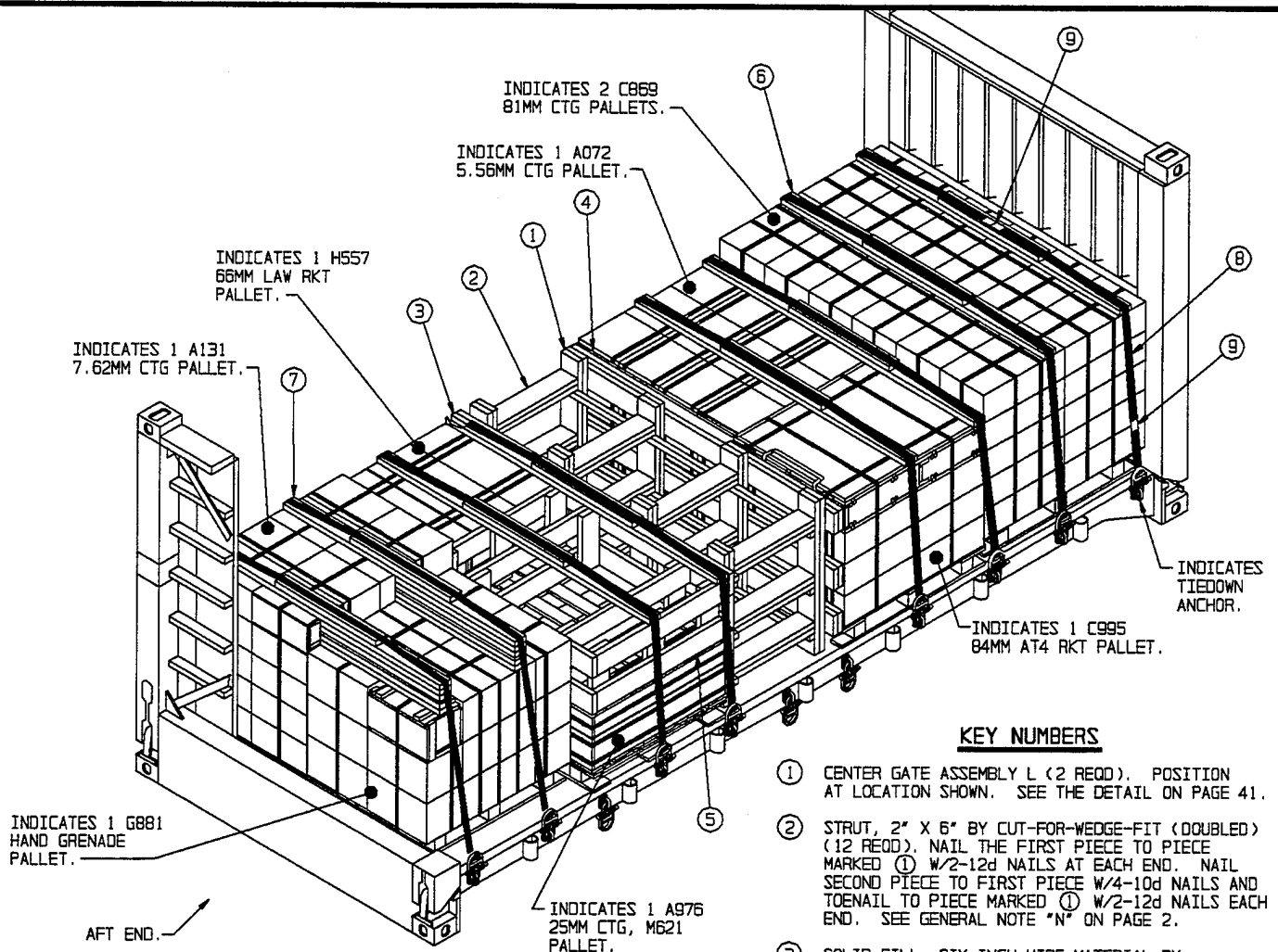
SPECIAL NOTES:

1. A TYPICAL LOAD OF 8 PALLETS OF 155MM PROPELLING CHARGE CONTAINERS IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE D541 155MM PROPELLING CHARGE PALLET, 50 CONTAINERS PER PALLET, HAVING DIMENSIONS OF 55" LONG BY 40" WIDE BY 44-7/8" HIGH AND WEIGHING 1,766 POUNDS IS SHOWN AS TYPICAL. IF LOADING PALLETIZED UNITS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE PALLETS TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.
6. FOR THE SAME ITEM ON THE M1077 FLATRACK SEE PAGES 30 AND 31.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	74	50
2" X 6"	34	34
NAILS	NO. REQD	POUNDS
10d (3")	80	1-1/4
STEEL STRAPPING, 2" - - - - 216' REQD - - - - 72 LBS		
SEAL FOR 2" STRAPPING - - - - 36 REQD - - - - 7-1/2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
155MM PC		
PALLET - - - - -	8 - - - - -	14,128 LBS
DUNNAGE - - - - -	- - - - -	250 LBS
TOTAL WEIGHT - - - - -		14,378 LBS



ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE ASSEMBLY L (2 REQD). POSITION AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 41.
- ② STRUT, 2" X 6" BY CUT-FOR-WEDGE-FIT (DOUBLED) (12 REQD). NAIL THE FIRST PIECE TO PIECE MARKED ① W/2-12d NAILS AT EACH END. NAIL SECOND PIECE TO FIRST PIECE W/4-10d NAILS AND TOENAIL TO PIECE MARKED ① W/2-12d NAILS EACH END. SEE GENERAL NOTE "N" ON PAGE 2.
- ③ SOLID FILL, SIX INCH WIDE MATERIAL BY THICKNESS REQUIRED TO FILL VOID SPACE BETWEEN GATE MARKED ① AND THE 66MM LAW RKT PALLET, BY 33" LONG (REF: 2" X 6" X 33") (3 REQD). NAIL TO THE LOAD BEARING PIECES ON GATE MARKED ① W/5-10d NAILS EACH PIECE.
- ④ SOLID FILL, SIX INCH WIDE MATERIAL BY THICKNESS REQUIRED TO FILL VOID SPACE BETWEEN GATE MARKED ① AND THE 5.56MM CTG PALLET, (REF: 2" X 6" X 51" AND 1" X 6" X 51") (3 REQD). NAIL FIRST PIECE TO THE LOAD BEARING PIECES ON PIECE MARKED ① W/5-10d NAILS. NAIL SECOND PIECE TO FIRST PIECE IN A LIKE MANNER.
- ⑤ FILLER ASSEMBLY B (1 REQD). POSITION ON TOP OF THE 25MM CARTRIDGE PALLET. SEE THE DETAIL ON PAGE 47.
- ⑥ STRAPPING BOARD ASSEMBLY C (6 REQD). POSITION AT THE LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑦ STRAPPING BOARD ASSEMBLY F (2 REQD). POSITION ON TOP OF THE 7.62MM CARTRIDGE PALLET AND THE HAND GRENADE PALLET AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑧ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS PIECES MARKED ⑨. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ⑨ SEAL FOR 2" STEEL STRAPPING (32 REQD) FOUR SEALS FOR EACH STRAP MARKED ⑧. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

TYPICAL AMMUNITION ITEMS

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
C869	81MM CARTRIDGE 51.00 L X 42.00 W X 44.87 H	180	2 PALLETS	3,596 LBS
A072	5.56MM CARTRIDGE 51.00 L X 43.50 W X 39.00 H	80,640	1 PALLET	3,401 LBS
C995	84MM AT4 ROCKET 45.87 L X 35.50 W X 39.00 H	20	1 PALLET	529 LBS
A976	25MM CARTRIDGE, M621 CNTR 53.00 L X 43.00 W X 21.37 H	810	1 PALLET	1,515 LBS
H557	66MM LAW ROCKET 41.25 L X 33.50 W X 36.87 H	45	1 PALLET	398 LBS
A131	7.62MM CARTRIDGE 46.00 L X 35.00 W X 46.12 H	32,000	1 PALLET	3,181 LBS
G881	HAND GRENADE 45.75 L X 37.87 W X 39.25 H	720	1 PALLET	1,309 LBS

MIXED BOXED AMMUNITION

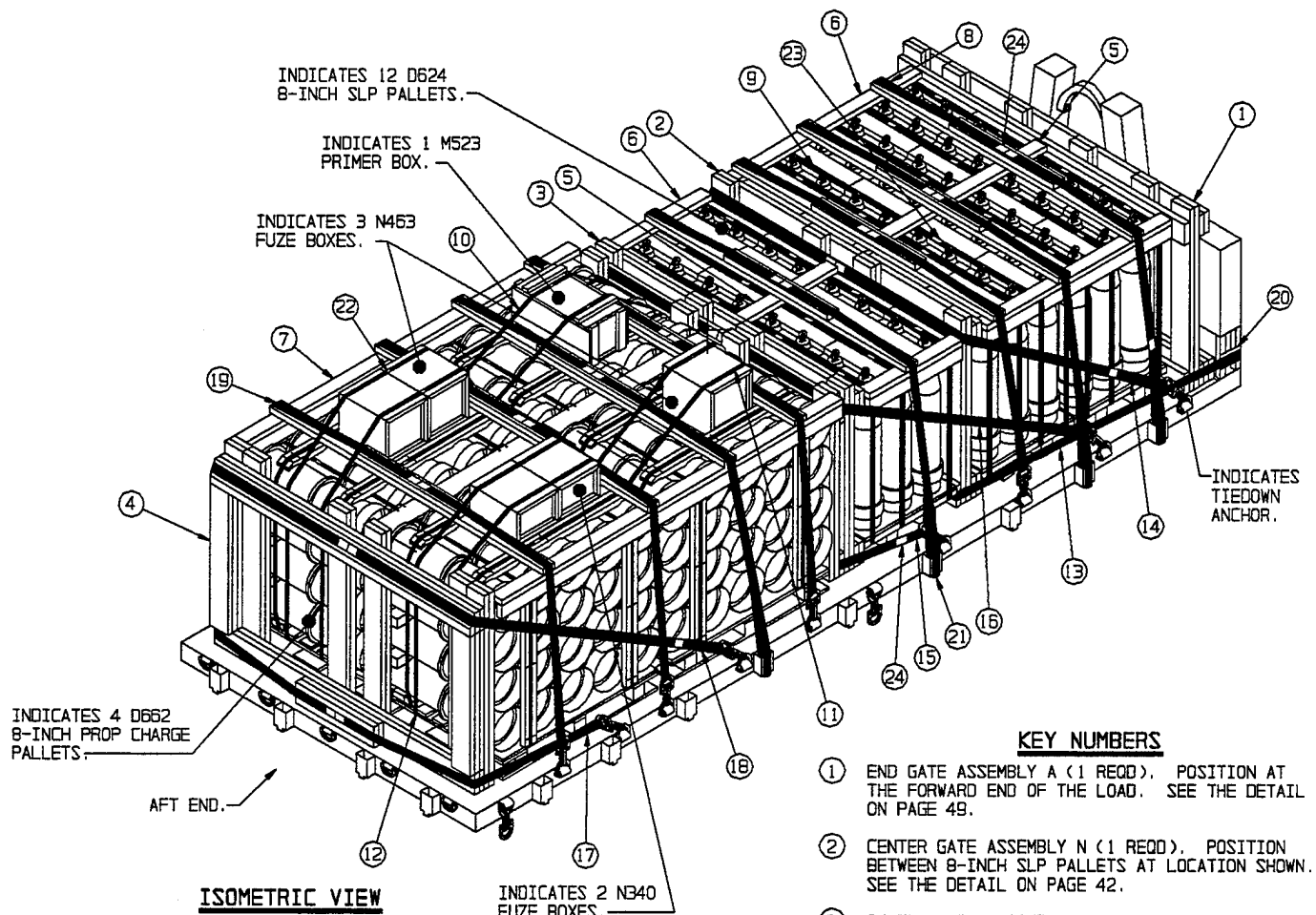
SPECIAL NOTES:

1. A TYPICAL LOAD OF MIXED BOXED AMMUNITION IS SHOWN LOADED ON THE M1 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 18'-6" LONG AND A MAXIMUM LOAD WEIGHT OF 28,750 POUNDS.
2. THE MIXED BOXED AMMUNITION SHOWN IN THE CHART ON PAGE 20 IS SHOWN AS TYPICAL. IF LOADING PALLETIZED UNITS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE PALLETS TIGHT AGAINST THE FORWARD END WALL AND THE AFT END WALL, LEAVING THE EXCESS SPACE IN THE CENTER AS SHOWN. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STEEL STRAPPING IS IN POSITION.
5. THE EXCESS SPACE REMAINING AFTER THE LOAD IS IN POSITION MUST BE FILLED WITH CENTER GATES AND STRUTS OR OTHER TYPES OF BLOCKING ASSEMBLIES AS REQUIRED TO ASSURE A LONGITUDINALLY TIGHT LOAD.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	4	2
1" X 6"	13	7
2" X 2"	44	15
2" X 4"	81	54
2" X 6"	268	268
NAILS	NO. REQD	POUNDS
10d (3")	560	8-1/2
12d (3-1/4")	96	1-1/2
STEEL STRAPPING, 2" - - - - 164' REQD - - - - 55 LBS		
SEAL FOR 2" STRAPPING - - - - 32 REQD - - - - -7 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
BOXED AMMO PALLETS	- - 8 - - - - -	13,929 LBS
DUNNAGE	- - - - -	764 LBS
TOTAL WEIGHT		- - - - - 14,693 LBS



KEY NUMBERS

- ① END GATE ASSEMBLY A (1 REQD). POSITION AT THE FORWARD END OF THE LOAD. SEE THE DETAIL ON PAGE 49.
- ② CENTER GATE ASSEMBLY N (1 REQD). POSITION BETWEEN 8-INCH SLP PALLETS AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 42.
- ③ CENTER GATE ASSEMBLY M (1 REQD). POSITION BETWEEN 8-INCH SLP PALLETS AND 8-INCH PROPELLING CHARGE PALLETS. SEE THE DETAIL ON PAGE 41.
- ④ END GATE ASSEMBLY B (1 REQD). POSITION AT THE AFT END OF THE LOAD. SEE THE DETAIL ON PAGE 49.
- ⑤ HOLD-DOWN, 2" X 4" BY LENGTH-TO-SUIT (2 REQD). POSITION ON JOINT BETWEEN 8-INCH SLP PALLETS.
- ⑥ HOLD-DOWN ASSEMBLY B (4 REQD). POSITION ON TOP OF THE 8-INCH SLP PALLETS AS SHOWN. SEE THE DETAIL ON PAGE 46.
- ⑦ HOLD-DOWN ASSEMBLY A (2 REQD). POSITION ON TOP OF PROP CHARGE PALLETS AS SHOWN. SEE THE DETAIL ON PAGE 46.
- ⑧ STRAPPING BOARD ASSEMBLY A (8 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO THE HOLD-DOWN PIECES MARKED ⑤ W/2-10d NAILS EACH JOINT. SEE THE DETAIL ON PAGE 44.
- ⑨ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (3 REQD). INSTALL EACH STRAP TO ENCIRCLE ALL LATERALLY ADJACENT SLP PALLETS IN EACH ROW, UNDER THE SKID BASE AND OVER TOP OF COVER. SEAL WITH ONE SEAL MARKED ②. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑩ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE THE PROPELLING CHARGE PALLET AND THE LOOSE BOX OF N523 PRIMERS AS SHOWN. THREAD STRAPS UNDER TOP DECK OF PROPELLING CHARGE PALLET. SEAL EACH STRAP WITH ONE SEAL MARKED ②. NOTE: THESE TWO STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLETS. SEE GENERAL NOTE "M" ON PAGE 2.

(KEY NUMBERS CONTINUED)

- ⑪ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (4 REQD). INSTALL EACH STRAP TO ENCIRCLE THE PROPELLING CHARGE PALLET AND THE LOOSE BOXES OF N463 FUZES AS SHOWN. THREAD STRAPS UNDER TOP DECK OF PROPELLING CHARGE PALLET. SEAL EACH STRAP WITH ONE SEAL MARKED ②. NOTE: THESE TWO STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLETS. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑫ LOOSE BOX HOLD-DOWN STRAP, 3/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE THE PROPELLING CHARGE PALLET AND THE LOOSE BOXES OF N340 FUZES AS SHOWN. THREAD STRAPS UNDER TOP DECK OF PROPELLING CHARGE PALLET. SEAL EACH STRAP WITH ONE SEAL MARKED ②. NOTE: THESE TWO STRAPS MUST BE PRE-POSITIONED PRIOR TO POSITIONING PALLETS. SEE GENERAL NOTE "M" ON PAGE 2.

(CONTINUED ON PAGE 23)

8-INCH COMBAT CONFIGURED LOAD

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
D662	PROP CHG. 8-INCH 52.50 L X 40.75 W X 48.50 H	80	4 PALLETS	6,952 LBS
D624	PROJ. 8-INCH M650 19.37 L X 28.50 W X 45.62 H	72	12 PALLETS	15,036 LBS
N340	FUZE, M739 14.63 L X 12.81 W X 8.50 H	32	2 BOXES	92 LBS
N463	FUZE, M728 14.63 L X 12.75 W X 12.00 H	48	3 BOXES	142 LBS
N523	PRIMER, M82 24.13 L X 12.00 W X 11.25 H	500	1 BOX	37 LBS

(CONTINUED AT LEFT)

SPECIAL NOTES:

1. A TYPICAL 8-INCH COMBAT CONFIGURED LOAD FOR FIELD ARTILLERY IS SHOWN LOADED ON THE 16-1/2-TON M1077 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 19'-0" LONG AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.
2. THE 8-INCH COMBAT CONFIGURED LOAD IN THE CHART ON PAGE 22 IS SHOWN AS TYPICAL. IF LOADING PALLETES OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETES, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. DUE TO WEIGHT, HIGH CENTER OF GRAVITY, AND SMALL SKID AREA CONTACTING THE STEEL FLOOR, SEPARATE LOADING PROJECTILE PALLETES MUST BE DIVIDED INTO SECTIONS NOT EXCEEDING 11,000 POUNDS. EACH SECTION MUST BE SECURED WITH A GATE AND STEEL STRAPPING AS SHOWN IN THE LOAD ON PAGE 22. NOTE THAT THE 12 PALLETES OF 8-INCH PROJECTILES SHOWN IN THE LOAD ON PAGE 22 HAVE A TOTAL WEIGHT OF 15,036 POUNDS. THE LOAD THEREFORE, WAS DIVIDED INTO TWO SECTIONS, WITH ONE SECTION WEIGHING 10,024 POUNDS AND ONE SECTION WEIGHING 5,012 POUNDS.
5. POSITION THE LOAD TIGHT AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATRACK. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER. LATERALLY AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STRAPPING IS IN POSITION.
6. FOR EASE OF LOADING AND SECUREMENT OF THE LOAD, EACH ROW OF SEPARATE LOADING PROJECTILES POSITIONED ACROSS THE WIDTH OF THE FLATRACK MUST CONTAIN THE SAME QUANTITY. USE AN "OMITTED SLP PALLETIZED UNIT ASSEMBLY" FOR EACH OMITTED UNIT AS NECESSARY TO MAINTAIN EVEN ROWS. SEE THE "OMITTED SLP PALLET UNIT ASSEMBLY" DETAIL ON PAGE 58.
7. WHEN POSITIONING LOOSE BOXES ON TOP OF A LOAD, CENTER THE BOXES BETWEEN TWO STRAPPING BOARD ASSEMBLIES WHEN POSSIBLE. THIS WILL HELP PROVIDE LONGITUDINAL SUPPORT ALONG WITH THE LOOSE BOX HOLD-DOWN STRAPS.
8. FOR THIS SAME 8-INCH COMBAT CONFIGURED LOAD ON THE M1 FLATRACK SEE PAGES 4 AND 5.

(KEY NUMBERS CONTINUED)

- 22 SEAL FOR 3/4" STEEL STRAPPING (8 REQ'D). ONE SEAL FOR EACH STRAP MARKED 10, 11 AND 12. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.
- 23 SEAL FOR 1-1/4" STEEL STRAPPING (3 REQ'D). ONE SEAL FOR EACH STRAP MARKED 9. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.
- 24 SEAL FOR 2" STEEL STRAPPING (64 REQ'D). SIX SEALS FOR EACH STRAP THREADED THRU THE STAKE POCKETS AND FOUR SEALS FOR EACH STRAP ATTACHED TO TIEDOWN ANCHORS. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	5	3
2" X 2"	8	3
2" X 4"	124	83
2" X 6"	395	395
NAILS	NO. REQ'D	POUNDS
10d (3")	559	9
STEEL STRAPPING, 2" - - - - 348' REQ'D - - - 116 LBS		
STEEL STRAPPING, 1-1/4" - - - 48' REQ'D - - - 7 LBS		
STEEL STRAPPING, 3/4" - - - 166' REQ'D - - - 12 LBS		
SEAL FOR 2" STRAPPING - - - - 64 REQ'D - - - 14 LBS		
SEAL FOR 1-1/4" STRAPPING - - - 3 REQ'D - - - NIL		
SEAL FOR 3/4" STRAPPING - - - 8 REQ'D - - - NIL		
EDGE PROTECTOR - - - - - 2 REQ'D - - - - NIL		

(KEY NUMBERS CONTINUED)

- 13 LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQ'D). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ENCIRCLING THE STEEL FRAME ON EACH SIDE OF THE A-FRAME, APPROXIMATELY 7" ABOVE THE FLOOR. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON CENTER GATE ASSEMBLY N AND SEAL WITH TWO SEALS MARKED 24. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- 14 LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQ'D). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON CENTER GATE ASSEMBLY N. POSITION STRAP ON BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED 24. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- 15 LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQ'D). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON CENTER GATE ASSEMBLY M AND SEAL WITH TWO SEALS MARKED 24. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE "NOTE 1" ON PAGE 41 AND GENERAL NOTE "L" ON PAGE 2.
- 16 LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQ'D). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AROUND THE TOP STRAPPING BOARD ON CENTER GATE ASSEMBLY M. POSITION STRAP ON BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED 24. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE "NOTE 1" ON PAGE 41 AND GENERAL NOTE "L" ON PAGE 2.
- 17 LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQ'D). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON END GATE ASSEMBLY B AND SEAL WITH TWO SEALS MARKED 24. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- 18 LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQ'D). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AROUND THE TOP STRAPPING BOARD ON END GATE ASSEMBLY B. POSITION STRAP ON BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED 24. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- 19 HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REQ'D). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A STAKE POCKET OR TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED 24. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGES 56 AND 57.
- 20 EDGE PROTECTOR, STEEL FOR 2" STEEL STRAPPING (2 REQ'D). POSITION UNDER STRAP MARKED 13 AT SHARP CORNER OF A-FRAME. IF EDGE PROTECTORS ARE NOT AVAILABLE, USE SHORT PIECE OF 2" STEEL STRAPPING.
- 21 PAD, 2" X .044" OR .050" BY 24" LENGTH OF STEEL STRAPPING (8 REQ'D). POSITION THROUGH STAKE POCKET UNDER STRAPS MARKED 19. SECURE WITH ONE SEAL MARKED 24. SEE THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 57.

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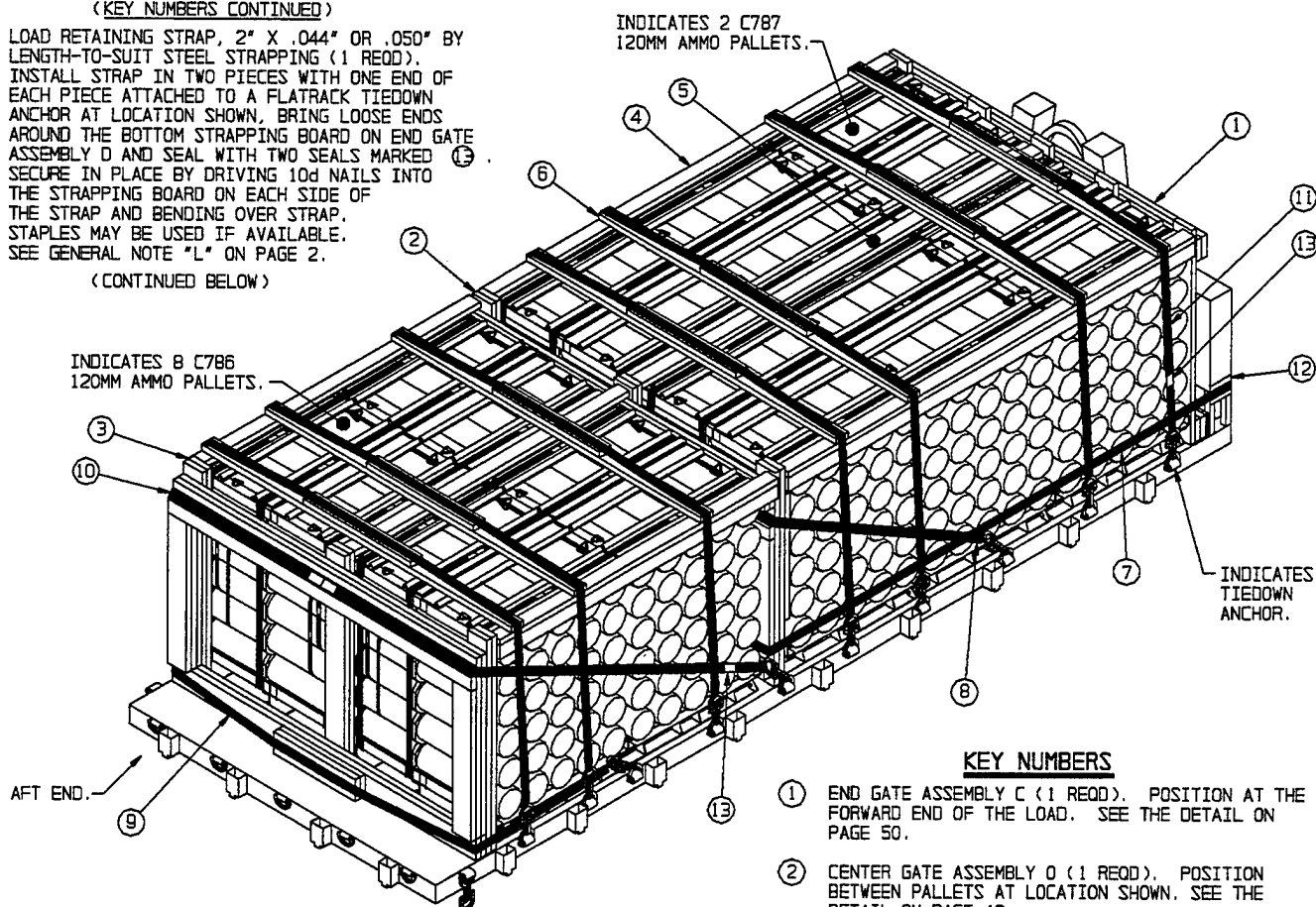
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
8-INCH CCL	1	22,259 LBS
DUNNAGE		1,126 LBS
TOTAL WEIGHT		23,385 LBS

(KEY NUMBERS CONTINUED)

- ⑨ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN, BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON END GATE ASSEMBLY D AND SEAL WITH TWO SEALS MARKED ⑬. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.

(CONTINUED BELOW)



ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

- ⑩ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATIONS SHOWN, BRING LOOSE ENDS AT AN ANGLE UP AROUND THE STRAPPING BOARD ON END GATE ASSEMBLY D. POSITION STRAPS ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑬. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑪ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (7 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑬. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑫ EDGE PROTECTOR, STEEL, FOR 2" STEEL STRAPPING (2 REQD). POSITION UNDER STRAP MARKED ⑦ AT SHARP CORNER OF A-FRAME. IF EDGE PROTECTORS ARE NOT AVAILABLE USE SHORT PIECE OF 2" STEEL STRAPPING.
- ⑬ SEAL FOR 2" STEEL STRAPPING (44 REQD). FOUR SEALS REQUIRED FOR EACH STRAP MARKED ⑦, ⑧, ⑨, ⑩ AND ⑪. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

KEY NUMBERS

- ① END GATE ASSEMBLY C (1 REQD). POSITION AT THE FORWARD END OF THE LOAD. SEE THE DETAIL ON PAGE 50.
- ② CENTER GATE ASSEMBLY D (1 REQD). POSITION BETWEEN PALLETS AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 42.
- ③ END GATE ASSEMBLY D (1 REQD). POSITION AT THE AFT END OF THE LOAD. SEE THE DETAIL ON PAGE 50.
- ④ HOLD-DOWN ASSEMBLY A, (4 REQD). POSITION ON TOP OF THE PALLETS AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 46.
- ⑤ HOLD-DOWN 2" X 6" BY LENGTH-TO-SUIT (2 REQD). POSITION ON JOINTS BETWEEN PALLETS AT LOCATION SHOWN.
- ⑥ STRAPPING BOARD ASSEMBLY A (7 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO THE HOLD-DOWN PIECES MARKED ⑤ W/2-10d NAILS EACH JOINT. SEE THE DETAIL ON PAGE 44.
- ⑦ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ENCIRCLING THE STEEL FRAME ON EACH SIDE OF THE A-FRAME, APPROXIMATELY 7" ABOVE THE FLOOR. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON CENTER GATE ASSEMBLY D AND SEAL WITH TWO SEALS MARKED ⑬. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑧ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN, BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE STRAPPING BOARD ON CENTER GATE ASSEMBLY D. POSITION STRAP ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑬. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.

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120MM COMBAT CONFIGURED LOAD

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
C786	CTG, 120MM M829 39.50 L X 44.50 W X 51.50 H	240	8 PALLETS	19,128 LBS
C787	CTG, 120MM M830 40.13 L X 44.50 W X 51.75 H	60	2 PALLETS	4,866 LBS

120MM ARMOR COMBAT CONFIGURED LOAD

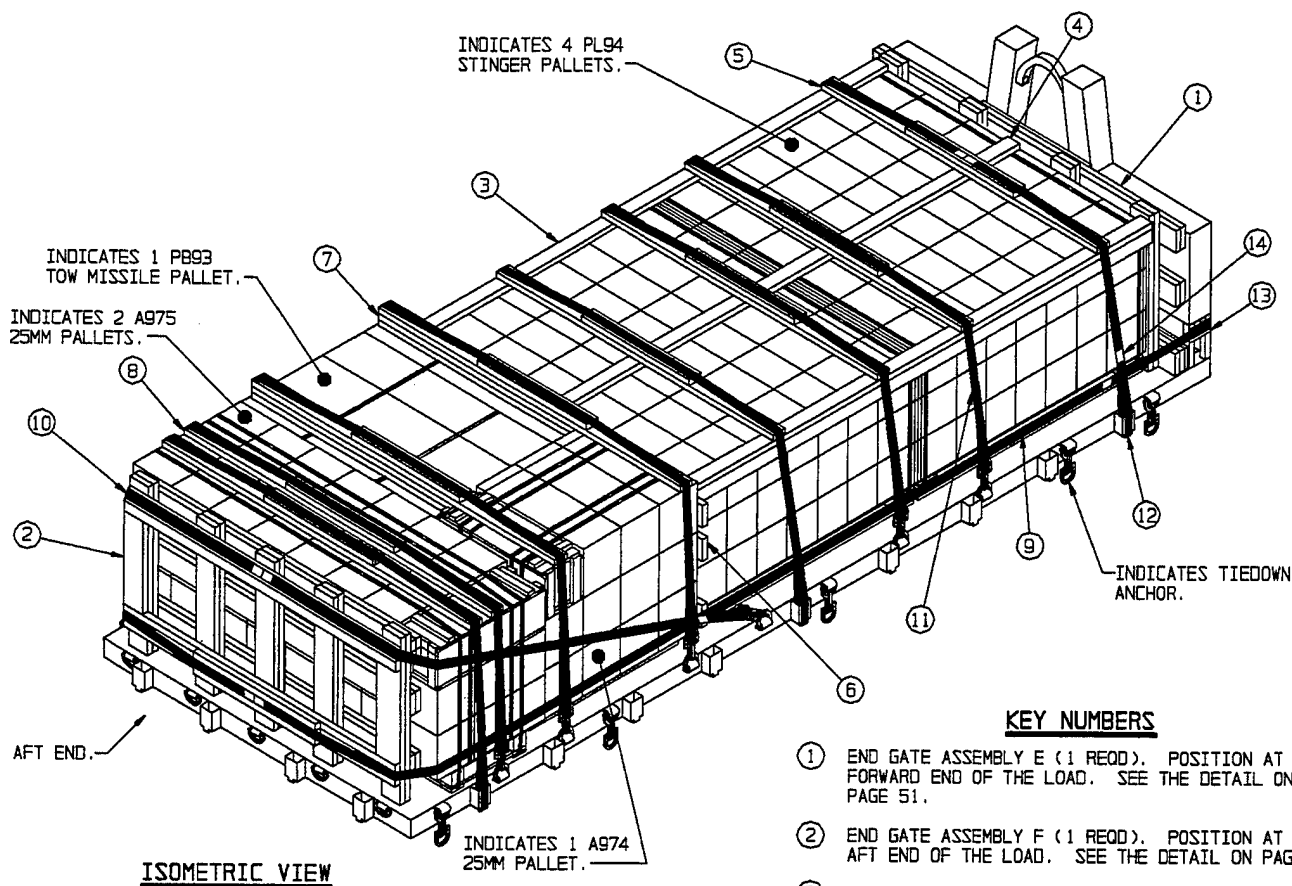
SPECIAL NOTES:

1. A TYPICAL 120MM COMBAT CONFIGURED LOAD FOR ARMOR IS SHOWN LOADED ON THE 16-1/2-TON M1077 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 19'-0" LONG AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.
2. THE 120MM COMBAT CONFIGURED LOAD SHOWN IN THE CHART ON PAGE 24 IS TYPICAL. IF LOADING PALLETIZED UNITS OR OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE 120MM PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. LOADS OF PALLETIZED UNITS, OTHER THAN SEPARATE LOADING PROJECTILES, HAVING A TOTAL WEIGHT OF 16,500 POUNDS OR MORE MUST BE DIVIDED INTO TWO SECTIONS. EACH SECTION MUST BE SECURED WITH A GATE AND STEEL STRAPPING AS SHOWN IN THE LOAD ON PAGE 24. NOTE THAT THE 10 PALLETS SHOWN IN THE LOAD ON PAGE 24 HAVE A TOTAL WEIGHT OF 23,994 POUNDS. THEREFORE, THE LOAD WAS DIVIDED INTO TWO SECTIONS WITH THE FORWARD SECTION WEIGHING 14,346 POUNDS AND THE AFT SECTION WEIGHING 9,648 POUNDS. IF LOADING PALLETIZED UNITS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES. IF LOADING SEPARATE LOADING PROJECTILES, FOLLOW THE PROCEDURES SHOWN ON PAGE 28.
5. POSITION THE LOAD TIGHT AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATRACK. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STRAPPING IS IN POSITION.
6. FOR EASE OF LOADING AND SECUREMENT OF THE LOAD, AN EVEN NUMBER OF PALLETIZED UNITS SHOULD BE LOADED ON EACH FLATRACK. IF AN ODD NUMBER OF PALLETIZED UNITS ARE TO BE LOADED, SEE THE LOAD ON PAGE 30 FOR GUIDANCE. ALWAYS POSITION A SINGLE PALLETIZED UNIT BETWEEN TWO FULL ROWS.
7. FOR THE SAME 120MM COMBAT CONFIGURED LOAD ON THE M1 FLATRACK, SEE PAGES 8 AND 9.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	13	7
2" X 4"	155	104
2" X 6"	240	240
NAILS	NO. REQD	POUNDS
6d (2")	32	1/4
10d (3")	361	5-1/2
STEEL STRAPPING, 2" - - - - 262' REQD - - - - 88 LBS		
SEAL FOR 2" STRAPPING - - - - 44 REQD - - - - 9 LBS		
EDGE PROTECTOR FOR 2" STRAPPING-2 REQD - - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
120MM AMMO PLT - - - -	10 - - - -	23,994 LBS
DUNNAGE - - - -	- - - -	805 LBS
TOTAL WEIGHT - - - -		24,799 LBS



(KEY NUMBERS CONTINUED)

- ⑪ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK, BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑭. SECURE INTO PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGES 56 AND 57.
- ⑫ PAD, 2" X .044" OR .050" BY 24" LENGTH OF STEEL STRAPPING (6 REQD). POSITION THROUGH STAKE POCKET UNDER STRAPS MARKED ⑨ AT LOCATIONS SHOWN. SECURE WITH ONE SEAL MARKED ⑭. SEE THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 57.
- ⑬ EDGE PROTECTOR, STEEL, FOR 2" STEEL STRAPPING (2 REQD). POSITION UNDER STRAP MARKED ⑨ AT SHARP CORNER OF A-FRAME. IF EDGE PROTECTORS ARE NOT AVAILABLE USE A SHORT PIECE OF 2" STEEL STRAPPING.
- ⑭ SEAL FOR 2" STEEL STRAPPING (38 REQD). SIX SEALS FOR EACH STRAP THREADED THRU THE STAKE POCKETS AND FOUR CRIMP SEALS FOR EACH STRAP ATTACHED TO TIEDOWN ANCHORS. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

KEY NUMBERS

- ① END GATE ASSEMBLY E (1 REQD). POSITION AT THE FORWARD END OF THE LOAD. SEE THE DETAIL ON PAGE 51.
- ② END GATE ASSEMBLY F (1 REQD). POSITION AT THE AFT END OF THE LOAD. SEE THE DETAIL ON PAGE 51.
- ③ HOLD-DOWN ASSEMBLY A, (2 REQD). POSITION AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 46.
- ④ HOLD-DOWN, 2" X 4" BY LENGTH-TO-SUIT (1 REQD). POSITION ON CENTER JOINT BETWEEN LATERALLY ADJACENT PALLETS.
- ⑤ STRAPPING BOARD ASSEMBLY A (4 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO THE HOLD-DOWN PIECES MARKED ④ W/2-10d NAILS EACH JOINT. SEE THE DETAIL ON PAGE 44.
- ⑥ FILLER ASSEMBLY C (1 REQD). POSITION AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 47.
- ⑦ STRAPPING BOARD ASSEMBLY D (2 REQD). POSITION AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑧ STRAPPING BOARD ASSEMBLY C (2 REQD). POSITION AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑨ LOAD RETAINING STRAP 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ENCIRCLING THE STEEL FRAME ON EACH SIDE OF THE A-FRAME, APPROXIMATELY 7" ABOVE THE FLOOR. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON END GATE ASSEMBLY F AND SEAL WITH TWO SEALS MARKED ⑭. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑩ LOAD RETAINING STRAP 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON END GATE ASSEMBLY F. POSITION STRAP ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑭. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.

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COMBAT CONFIGURED LOAD FOR AIR DEFENSE ARTILLERY

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
PL94	STINGER-MR, FIM 92C 39.37 L X 67.25 W X 36.50 H	36	4 PALLETS	2,996 LBS
P893	TOW IIA, BGM-710 48.00 L X 58.25 W X 39.75 H	12	1 PALLET	1,127 LBS
A974	25MM CARTRIDGE, APDS-T, M791 31.50 L X 45.00 W X 42.50 H	600	1 PALLET	1,241 LBS
A975	25MM CARTRIDGE, HEI-T, M792 31.50 L X 45.00 W X 42.50 H	1,200	2 PALLETS	2,482 LBS

SPECIAL NOTES:

1. A TYPICAL COMBAT CONFIGURED LOAD FOR AIR DEFENSE ARTILLERY IS SHOWN LOADED ON THE 16-1/2-TON M1077 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 19'-0" LONG AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.
2. THE COMBAT CONFIGURED LOAD SHOWN IN THE CHART ON PAGE 26 IS TYPICAL. IF LOADING PALLETS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE LOAD TIGHT AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATRACK. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally and Longitudinally to Reduce Load Movement AND ASSURE A TIGHT LOAD AFTER THE HOLD-DOWN STRAPPING IS IN POSITION.
5. FOR THE SAME COMBAT CONFIGURED LOAD ON THE M1 FLATRACK, SEE PAGES 10 AND 11.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	8	4
2" X 2"	9	3
2" X 4"	127	85
2" X 6"	210	210
NAILS	NO. REQD	POUNDS
6d (2")	16	NIL
10d (3")	358	5-1/2
STEEL STRAPPING, 2" - - - - 266' REQD - - - - 89 LBS		
SEAL FOR 2" STRAPPING - - - - 38 REQD - - - - 8 LBS		
EDGE PROTECTOR FOR 2" STRAPPING-2 REQD - - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CCL - - - - -	1 - - - - -	7,846 LBS
DUNNAGE - - - - -	- - - - -	707 LBS
TOTAL WEIGHT - - - - -		8,553 LBS

(KEY NUMBERS CONTINUED)

- ⑪ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON CENTER GATE ASSEMBLY P. POSITION STRAP ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑫. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.

AFT END.

ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

- ⑫ BUNDLING STRAP, 1-1/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP TO ENCIRCLE TWO LONGITUDINALLY ADJACENT PALLET UNITS, CENTER GATE ASSEMBLY O, AND END GATE ASSEMBLY H. POSITION STRAPS AROUND CENTERS OF THE THIRD PALLET FROM EACH SIDE, UNDER SKIDS AND OVER TOP OF COVER. PRE-POSITION STRAPS ON FLOOR OF FLATRACK PRIOR TO LOADING THE TWELVE PALLET UNITS AT THE AFT END. POSITION STRAPS UNDER THE STRAPPING BOARDS MARKED ⑦ AND SEAL WITH ONE SEAL MARKED ⑫. SEE SPECIAL NOTE 7 ON PAGE 29 AND GENERAL NOTE "M" ON PAGE 2.
- ⑬ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON CENTER GATE ASSEMBLY O AND SEAL WITH TWO SEALS PIECES MARKED ⑫. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE SPECIAL NOTE 7 ON PAGE 29 AND GENERAL NOTE "L" ON PAGE 2.
- ⑭ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON CENTER GATE ASSEMBLY O, POSITION STRAP ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑫. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE SPECIAL NOTE 7 ON PAGE 29 AND GENERAL NOTE "L" ON PAGE 2 AND THE STRAP THREADING DETAIL ON PAGE 56.

(KEY NUMBERS CONTINUED ON PAGE 29)

INDICATES 36 D563 155MM SLP PALLETS.

INDICATES TIEDOWN ANCHOR.

KEY NUMBERS

- ① END GATE ASSEMBLY G (1 REQD). POSITION AT THE FORWARD END OF THE LOAD. SEE THE DETAIL ON PAGE 52.
- ② CENTER GATE ASSEMBLY P (1 REQD). POSITION BETWEEN PALLETS AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 43.
- ③ CENTER GATE ASSEMBLY O (1 REQD). POSITION BETWEEN PALLETS AT LOCATION SHOWN. SEE THE DETAIL ON PAGE 43, AND SPECIAL NOTE 7 ON PAGE 29.
- ④ END GATE ASSEMBLY H (1 REQD). POSITION AT AFT END OF LOAD. SEE THE DETAIL ON PAGE 52.
- ⑤ HOLD-DOWN ASSEMBLY B (6 REQD). POSITION ON TOP OF THE PALLETS AS SHOWN. SEE THE DETAIL ON PAGE 46.
- ⑥ HOLD-DOWN, 2" X 4" X 58" (6 REQD). POSITION ON JOINTS BETWEEN PALLETS AT LOCATIONS SHOWN.
- ⑦ STRAPPING BOARD ASSEMBLY A (8 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO THE HOLD-DOWN PIECES MARKED ⑥ W/2-10d NAILS EACH JOINT. SEE THE DETAIL ON PAGE 44.
- ⑧ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY LENGTH-TO-SUIT STEEL STRAPPING (12 REQD). INSTALL EACH STRAP TO ENCIRCLE THREE LATERALLY ADJACENT PALLET UNITS UNDER THE SKID BASE AND OVER TOP OF COVER. THESE STRAPS MAY BE POSITIONED PRIOR TO LOADING PALLETS ON THE FLATRACK. SEAL WITH ONE SEAL MARKED ⑫. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑨ BUNDLING STRAP, 1-1/4" X .035" OR .031" BY LENGTH REQUIRED TO ENCIRCLE SIX LATERALLY ADJACENT PALLET UNITS UNDER THE SKID BASE AND OVER TOP OF COVER (6 REQD). POSITION STRAPS AT CENTER OF PALLETS. SEAL WITH ONE SEAL MARKED ⑫. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑩ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ENCIRCLING THE STEEL FRAME ON EACH SIDE OF THE A-FRAME, APPROXIMATELY 7" ABOVE THE FLOOR. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON CENTER GATE ASSEMBLY P. SEAL WITH TWO SEALS MARKED ⑫. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.

120MM COMPLETE ROUND CONFIGURED LOAD

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
D563	PROJ, 155MM, M483A1 DPICM 14.62 L X 29.12 W X 39.38 H	288	36 PALLETS	31,464 LBS

155MM SEPARATE LOADING PROJECTILES

(CONTINUED AT LEFT)

SPECIAL NOTES:

1. A TYPICAL LOAD OF 36 PALLETS OF 155MM SEPARATE LOADING PROJECTILES IS SHOWN LOADED ON THE 16-1/2-TON M1077 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 19'-0" LONG AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.
2. THE 155MM SLP (D563) EIGHT PROJECTILE PALLET HAVING DIMENSIONS OF 29-1/8" WIDE BY 14-5/8" LONG BY 39-3/8" HIGH AND WEIGHING 874 POUNDS IS SHOWN AS TYPICAL. IF LOADING SEPARATE LOADING PROJECTILES OF OTHER QUANTITIES, DIMENSIONS, AND WEIGHT, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE SLP PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. DUE TO WEIGHT, HIGH CENTER OF GRAVITY, AND SMALL SKID AREA CONTACTING THE STEEL FLOOR, LOADS OF SEPARATE LOADING PROJECTILES MUST BE DIVIDED INTO SECTIONS WHICH MUST NOT EXCEED 11,000 POUNDS. EACH SECTION MUST BE SECURED WITH A GATE AND STEEL STRAPPING AS SHOWN IN THE LOAD ON PAGE 28. NOTE THAT THE 36 PALLETS SHOWN IN THE LOAD ON PAGE 28 HAVE A TOTAL WEIGHT OF 31,464 POUNDS. THEREFORE, THE LOAD WAS DIVIDED INTO THREE SECTIONS WEIGHING 10,488 POUNDS EACH.
5. POSITION THE LOAD TIGHT AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATRACK. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER HOLD-DOWN STEEL STRAPPING IS IN POSITION.
6. FOR EASE OF LOADING AND SECUREMENT OF THE LOAD, EACH ROW OF SEPARATE LOADING PROJECTILES POSITIONED ACROSS THE WIDTH OF THE FLATRACK MUST CONTAIN THE SAME QUANTITY. USE AN "OMITTED SLP PALLETIZED UNIT ASSEMBLY" FOR EACH OMITTED UNIT AS NECESSARY TO MAINTAIN ROWS. SEE THE "OMITTED SLP PALLETIZED UNIT ASSEMBLY" DETAIL ON PAGE 58.
7. STRAPS MARKED ⑫ MUST BE PRE-POSITIONED ON THE FLOOR OF FLATRACK AND AROUND CENTER GATE ASSEMBLY Q PRIOR TO INSTALLING STRAPS MARKED ⑬ AND ⑭, AND THE LAST TWO ROWS OF SEPARATE LOADING PROJECTILE PALLETS. POSITION STRAPS MARKED ⑫ TO CENTER ON THE THIRD PALLET FROM EACH SIDE OF THE FLATRACK. STRAPS MARKED ⑫ ARE REQUIRED TO HELP RETAIN THE CENTER ROWS OF PALLETS DURING AFT END IMPACT.
8. TWO LOAD RETAINING STRAPS MARKED ⑮ AND TWO LOAD RETAINING STRAPS MARKED ⑯ ARE REQUIRED AT THE AFT END OF THE LOAD DUE TO THE MAXIMUM LOAD WEIGHT AND SMALL SKID AREA OF THE 155MM SLP PALLETS.
9. FOR THE SAME ITEM ON THE M1 FLATRACK SEE PAGES 16 AND 17.

(KEY NUMBERS CONTINUED)

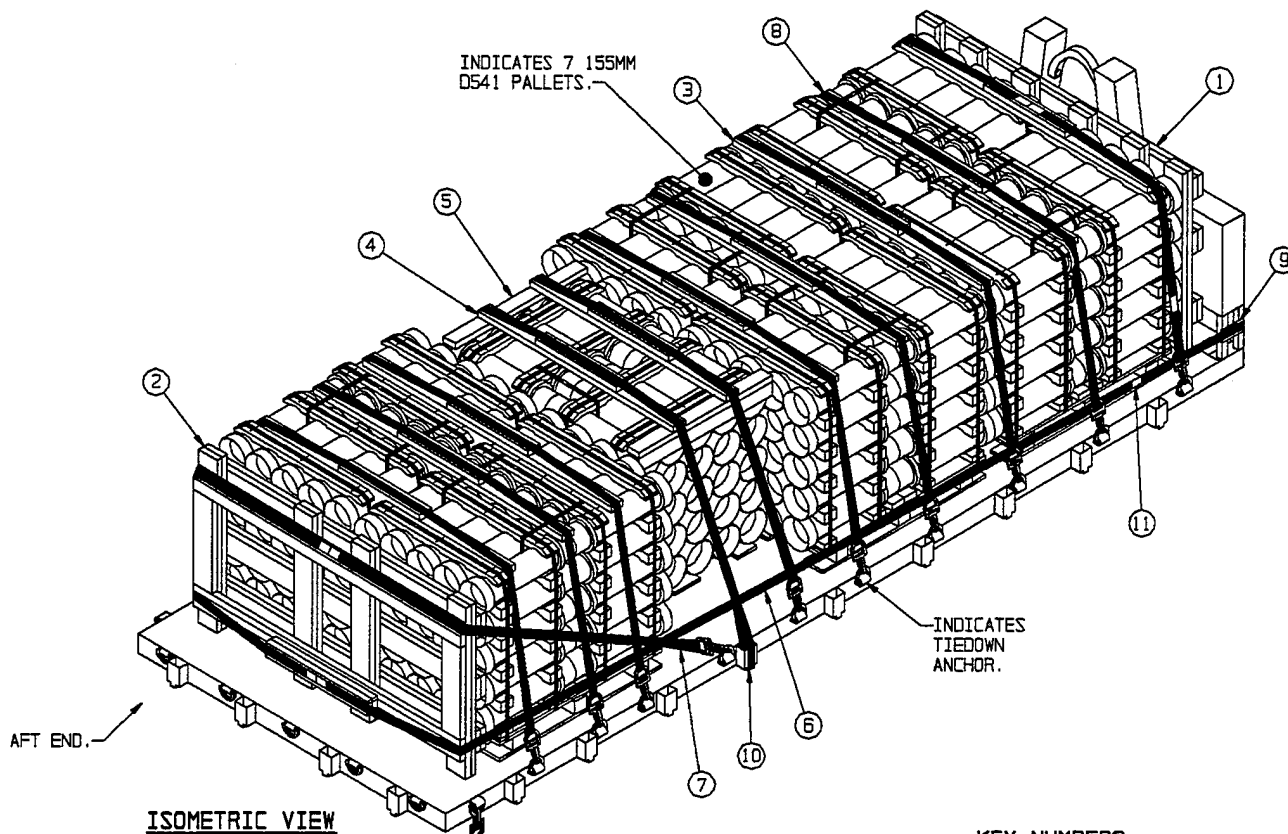
- ⑮ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATIONS SHOWN. INSTALL THE SHORTEST STRAPS FIRST THEN THE LONGER STRAPS OVER TOP OF SHORT STRAPS AND TO DIFFERENT TIEDOWN ANCHORS. BRING LOOSE END AROUND THE BOTTOM STRAPPING BOARD ON END GATE ASSEMBLY H AND SEAL WITH TWO SEALS PIECES MARKED ⑳. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND SPECIAL NOTE 8 ON THIS PAGE.
- ⑯ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (2 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATIONS SHOWN. INSTALL THE SHORTEST STRAPS FIRST THEN THE LONGER STRAPS OVER TOP OF SHORT STRAPS AND TO DIFFERENT TIEDOWN ANCHORS. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON END GATE ASSEMBLY H. POSITION STRAPS ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑳. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND SPECIAL NOTE 8 ON THIS PAGE.
- ⑰ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A STAKE POCKET OR TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS PIECES MARKED ⑳. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAILS ON PAGES 56 AND 57.
- ⑱ EDGE PROTECTOR, STEEL, FOR 2" STEEL STRAPPING (2 REQD). POSITION UNDER STRAP MARKED ⑮ AT SHARP CORNER OF A-FRAME. IF EDGE PROTECTORS ARE NOT AVAILABLE USE A SHORT PIECE OF 2" STEEL STRAPPING.
- ⑲ PAD, 2" X .044" OR .050" X 24" LENGTH OF STEEL STRAPPING (12 REQD). POSITION THROUGH STAKE POCKET UNDER STRAPS MARKED ⑰. SECURE WITH ONE SEAL MARKED ⑳. SEE THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 57.
- ⑳ SEAL FOR 1-1/4" STEEL STRAPPING (20 REQD). ONE SEAL FOR EACH STRAP MARKED ⑮, ⑯, ⑰. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.
- ㉑ SEAL FOR 2" STEEL STRAPPING (76 REQD). SIX SEALS FOR EACH STRAP THREADED THRU STAKE POCKETS AND FOUR SEALS FOR EACH STRAP ATTACHED TO TIEDOWN ANCHORS. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	5	3
2" X 2"	8	3
2" X 4"	169	113
2" X 6"	322	322
NAILS	NO. REQD	POUNDS
6d (2")	11	1/4
10d (3")	511	8
STEEL STRAPPING, 1-1/4" --- 344' REQD --- 50 LBS		
STEEL STRAPPING, 2" --- 460' REQD --- 154 LBS		
SEAL FOR 1-1/4" STRAPPING --- 20 REQD --- 17 LBS		
SEAL FOR 2" STRAPPING --- 76 REQD --- 12 LBS		
EDGE PROTECTOR FOR 2" STRAPPING-2 REQD --- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
155 MM SLP PLTS	36	31,464 LBS
DUNNAGE		1,108 LBS
TOTAL WEIGHT		32,572 LBS



ISOMETRIC VIEW

KEY NUMBERS

(KEY NUMBERS CONTINUED)

- ⑧ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (10 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A STAKE POCKET OR TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑪. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGES 56 AND 57.
- ⑨ EDGE PROTECTOR, STEEL, FOR 2" STEEL STRAPPING (2 REQD). POSITION UNDER STRAP MARKED ⑥ AT SHARP CORNER OF A-FRAME. IF EDGE PROTECTORS ARE NOT AVAILABLE USE A SHORT PIECE OF 2" STEEL STRAPPING.
- ⑩ PAD, 2" X .044" OR .050" BY 24" LENGTH OF STEEL STRAPPING (2 REQD). POSITION THROUGH STAKE POCKET UNDER STRAP MARKED ⑥. SECURE WITH ONE SEAL MARKED ⑪. SEE THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 57.
- ⑪ SEAL FOR 2" STEEL STRAPPING (50 REQD). SIX SEALS FOR THE STRAP THREADED THRU THE STAKE POCKETS AND FOUR SEALS FOR EACH STRAP ATTACHED TO TIEDOWN ANCHORS. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

- ① END GATE ASSEMBLY J (1 REQD). POSITION AT THE FORWARD END OF THE LOAD. SEE THE DETAIL ON PAGE 53.
- ② END GATE ASSEMBLY K (1 REQD). POSITION AT AFT END OF LOAD. SEE THE DETAIL ON PAGE 53.
- ③ STRAPPING BOARD ASSEMBLY F (8 REQD). POSITION AT THE LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ④ STRAPPING BOARD ASSEMBLY A (2 REQD). POSITION AT THE LOCATIONS SHOWN AND NAIL TO THE HOLD-DOWN PIECES MARKED ⑤ W/2-10d NAILS EACH END. SEE THE DETAIL ON PAGE 44.
- ⑤ HOLD-DOWN ASSEMBLY A (2 REQD). POSITION ON TOP OF THE PALLETS AS SHOWN. SEE THE DETAIL ON PAGE 46.
- ⑥ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ENCIRCLING THE STEEL FRAME ON EACH SIDE OF THE A-FRAME, APPROXIMATELY 7" ABOVE THE FLOOR. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON END GATE ASSEMBLY K AND SEAL WITH TWO SEALS MARKED ⑪. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑦ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON END GATE ASSEMBLY K. POSITION STRAP ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑪. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.

TYPICAL AMMUNITION ITEMS

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
D541	PROP CHARGE 155MM M4 55.00 L X 40.00 W X 44.88 H	350	7 PALLETS	12,362 LBS

(KEY NUMBERS CONTINUED AT LEFT)

155MM PROPELLING CHARGE CONTAINERS

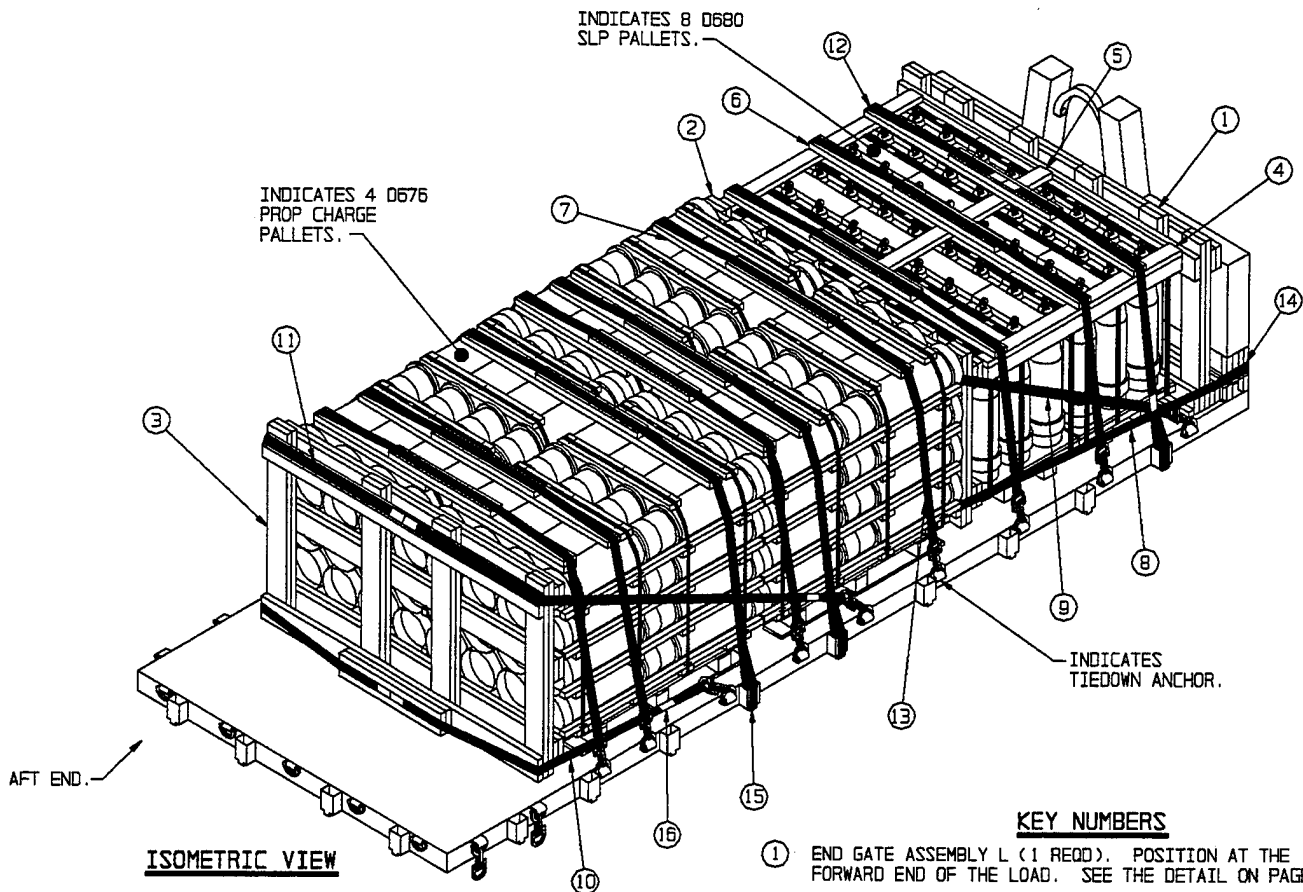
SPECIAL NOTES:

1. A TYPICAL LOAD OF 7 PALLETS OF 155MM PROPELLING CHARGE CONTAINERS IS SHOWN LOADED ON THE 16-1/2-TON M1077 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 19'-0" LONG AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.
2. THE 155MM PROPELLING CHARGE (D541) PACKED IN THE M13 SERIES CONTAINER, 50 CONTAINERS PER PALLET HAVING DIMENSIONS OF 40" LONG BY 55" WIDE BY 44-7/8" HIGH AND WEIGHING 1,766 POUNDS, IS SHOWN AS TYPICAL. IF LOADING PALLETIZED UNITS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE 155MM PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. LOADS OF METAL AND/OR WOOD PALLETIZED UNITS, OTHER THAN SEPARATE LOADING PROJECTILES, HAVING A TOTAL WEIGHT OF 16,500 POUNDS OR MORE MUST BE DIVIDED INTO TWO SECTIONS, EACH SECTION MUST BE SECURED WITH A GATE AND STEEL STRAPPING AS SHOWN IN THE LOAD ON PAGE 28. NOTE THAT THE 7 PALLETS SHOWN IN THE LOAD ON PAGE 30 HAVE A TOTAL WEIGHT OF 12,362 POUNDS, THEREFORE, THE LOAD WAS NOT DIVIDED. IF LOADING PALLETIZED UNITS OF OTHER ITEMS, SIZES, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES. IF LOADING SEPARATE LOADING PROJECTILES FOLLOW THE PROCEDURES SHOWN ON PAGE 28.
5. POSITION THE LOAD TIGHT AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATRACK. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER HOLD-DOWN STEEL STRAPPING IS IN POSITION.
6. FOR EASE OF LOADING AND SECUREMENT OF THE LOAD, AN EVEN NUMBER OF PALLETIZED UNITS SHOULD BE LOADED ON EACH FLATRACK. HOWEVER, DUE TO THE SIZE OF THE PALLETIZED UNIT SHOWN IN THE LOAD ON PAGE 30, IT WAS NECESSARY TO LOAD AN ODD NUMBER OF PALLETIZED UNITS WITH ONE PALLETIZED UNIT POSITIONED WITH THE 40" DIMENSION PARALLEL TO THE SIDE OF THE FLATRACK, IN ORDER TO ACHIEVE A MAXIMUM LOAD.
7. FOR THE SAME ITEM LOADED ON THE M1 FLATRACK SEE PAGES 18 AND 19.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	97	65
2" X 6"	179	179
NAILS	NO. REQD	POUNDS
10d (3")	370	6
STEEL STRAPPING, 2" - - - - - 308' REQD - - -103 LBS		
SEAL FOR 2" STRAPPING - - - - - 50 REQD - - - 11 LBS		
EDGE PROTECTOR FOR 2" STRAPPING - 2 REQD - - - NIL		

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
155MM PROP CHARGE		
PALLET - - - - -	7 - - - - -	12,362 LBS
DUNNAGE - - - - -	- - - - -	608 LBS
TOTAL WEIGHT - - - - -		12,970 LBS



KEY NUMBERS

- ① END GATE ASSEMBLY L (1 REQD). POSITION AT THE FORWARD END OF THE LOAD. SEE THE DETAIL ON PAGE 54.
- ② CENTER GATE ASSEMBLY R (1 REQD). POSITION BETWEEN THE SEPARATE LOADING PROJECTILE PALLETS AND THE PROPELLING CHARGE PALLETS. SEE THE DETAIL ON PAGE 44.
- ③ END GATE ASSEMBLY M (1 REQD). POSITION AT AFT END OF LOAD. SEE THE DETAIL ON PAGE 54.
- ④ HOLD-DOWN ASSEMBLY B (2 REQD). POSITION ON TOP OF THE SEPARATE LOADING PROJECTILE PALLETS AS SHOWN. SEE THE DETAIL ON PAGE 46.
- ⑤ HOLD-DOWN, 2" X 4" X 56" (1 REQD). POSITION ON CENTER JOINT BETWEEN SEPARATE LOADING PROJECTILE PALLETS.
- ⑥ STRAPPING BOARD ASSEMBLY A (3 REQD). POSITION ON TOP OF THE SEPARATE LOADING PROJECTILE PALLETS AT LOCATIONS SHOWN. NAIL TO THE HOLD-DOWN PIECE MARKED ⑤ W/2-10d NAILS EACH JOINT. SEE THE DETAIL ON PAGE 44.
- ⑦ STRAPPING BOARD ASSEMBLY E (6 REQD). POSITION ON TOP OF THE PROPELLING CHARGE PALLETS AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ⑧ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ENCIRCLING THE STEEL FRAME ON EACH SIDE OF THE A-FRAME APPROXIMATELY 7" ABOVE THE FLOOR. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON CENTER GATE ASSEMBLY R AND SEAL WITH TWO SEALS MARKED ⑩. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑨ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON CENTER GATE ASSEMBLY R. POSITION STRAP ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑩.

(KEY NUMBERS CONTINUED)

SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.

- ⑩ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON END GATE ASSEMBLY M AND SEAL WITH TWO SEALS MARKED ⑩. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.

(KEY NUMBERS CONTINUED ON PAGE 33)

TYPICAL AMMUNITION ITEMS

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
D680	PROJ, 8-INCH 19.25 L X 28.00 W X 40.38 H	48	8 PALLETS	10,024 LBS
D676	PROP CHARGE, 8-INCH 58.50 L X 40.75 W X 46.25 H	128	4 PALLETS	7,512 LBS

(CONTINUED AT LEFT)

SPECIAL NOTES:

1. A TYPICAL LOAD OF 8 PALLETS OF 8-INCH SLP AND 4 PALLETS OF 8-INCH PROP CHARGE ARE SHOWN LOADED ON THE 16-1/2-TON A-FRAME FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 19'-0" LONG AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.
2. THE ITEMS SHOWN IN THE CHART ON PAGE 32 ARE SHOWN AS TYPICAL. IF LOADING PALLETS OF OTHER ITEMS, QUANTITIES, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE PALLETS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. POSITION THE LOAD TIGHT AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATRACK. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER Laterally AND LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER HOLD-DOWN STRAPPING IS IN POSITION.
5. FOR EASE OF LOADING AND SECUREMENT OF THE LOAD EACH ROW OF SEPARATE LOADING PROJECTILES POSITIONED ACROSS THE WIDTH OF THE FLATRACK MUST CONTAIN THE SAME QUANTITY. USE AN "OMITTED SLP PALLETIZED UNIT ASSEMBLY" FOR EACH OMITTED SLP PALLETIZED UNIT AS NECESSARY TO MAINTAIN EVEN ROWS. SEE THE "OMITTED SLP PALLET UNIT ASSEMBLY" DETAIL ON PAGE 58.

(KEY NUMBERS CONTINUED FROM PAGE 32)

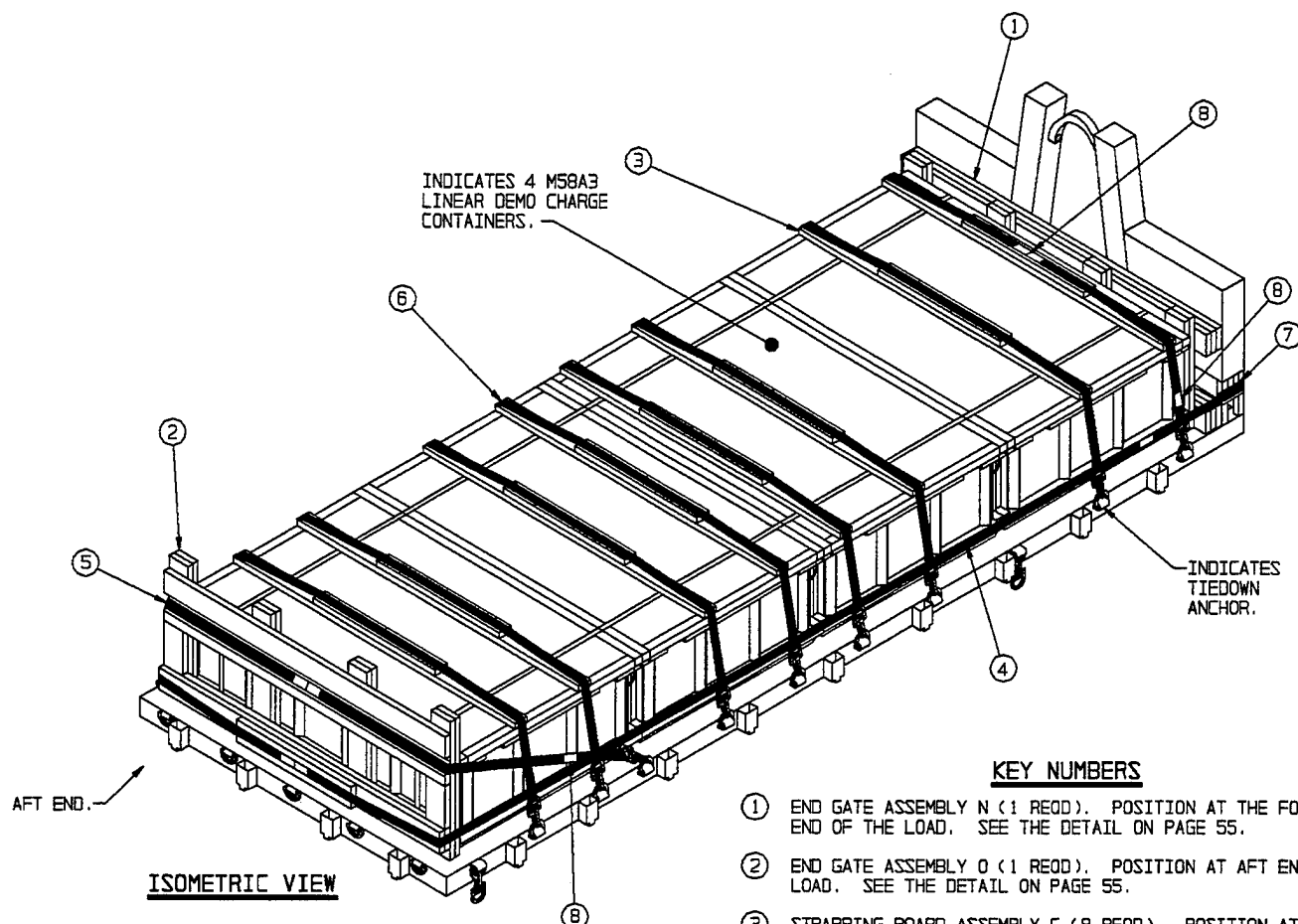
- ⑪ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLATRACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON END GATE ASSEMBLY M, POSITION STRAP ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑩. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ⑫ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (3 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A STAKE POCKET ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD MARKED ⑥ AND SEAL WITH TWO SEALS MARKED ⑩. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGES 56 AND 57.
- ⑬ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (6 REQD). INSTALL STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A STAKE POCKET OR TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD MARKED ⑦ AND SEAL WITH TWO SEALS MARKED ⑩. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGES 56 AND 57.
- ⑭ EDGE PROTECTOR, STEEL, FOR 2" STEEL STRAPPING (2 REQD). POSITION UNDER STRAP MARKED ⑧ AT SHARP CORNER OF A-FRAME. IF EDGE PROTECTORS ARE NOT AVAILABLE USE A SHORT PIECE OF 2" STEEL STRAPPING.
- ⑮ PAD, 2" X .044" OR .050" BY 24" LENGTH OF STEEL STRAPPING (6 REQD). POSITION THROUGH STAKE POCKET UNDER STRAP MARKED ② AND ③ IF APPLICABLE. SECURE WITH ONE SEAL MARKED ⑩. SEE THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ⑯ SEAL FOR 2" STEEL STRAPPING (58 REQD). FOUR SEALS FOR EACH STRAP MARKED ⑧, ⑨, ⑪, ⑫ AND ⑬, AND SIX SEALS FOR EACH STRAP MARKED ⑭. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	5	3
2" X 2"	8	3
2" X 4"	106	71
2" X 6"	277	277
NAILS	NO. REQD	POUNDS
6d (2")	11	1/4
10d (3")	463	7-1/4
STEEL STRAPPING, 2" - - - - - 372' REQD - - - 124 LBS		
SEAL FOR 2" STRAPPING - - - - - 58 REQD - - - 12 LBS		
EDGE PROTECTOR FOR 2" STRAPPING - 2 REQD - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
8-INCH SLP PALLET	8	10,024 LBS
8-INCH PC PALLET	4	7,512 LBS
DUNNAGE		852 LBS
TOTAL WEIGHT		18,388 LBS



KEY NUMBERS

- ① END GATE ASSEMBLY N (1 REQD). POSITION AT THE FORWARD END OF THE LOAD. SEE THE DETAIL ON PAGE 55.
- ② END GATE ASSEMBLY O (1 REQD). POSITION AT AFT END OF LOAD. SEE THE DETAIL ON PAGE 55.
- ③ STRAPPING BOARD ASSEMBLY C (8 REQD). POSITION AT LOCATIONS SHOWN. SEE THE DETAIL ON PAGE 45.
- ④ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ENCIRCLING THE STEEL FRAME ON EACH SIDE OF THE A-FRAME, APPROXIMATELY 7" ABOVE THE FLOOR. BRING LOOSE ENDS AROUND THE BOTTOM STRAPPING BOARD ON END GATE ASSEMBLY O AND SEAL WITH TWO SEALS MARKED ⑧. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑤ LOAD RETAINING STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (1 REQD). INSTALL IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A FLAT-RACK TIEDOWN ANCHOR AT LOCATION SHOWN. BRING LOOSE ENDS AT AN ANGLE UP AND AROUND THE TOP STRAPPING BOARD ON END GATE ASSEMBLY O. POSITION STRAP ON THE BEVELED SURFACE AND SEAL WITH TWO SEALS MARKED ⑧. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGE 56.
- ⑥ HOLD-DOWN STRAP, 2" X .044" OR .050" BY LENGTH-TO-SUIT STEEL STRAPPING (8 REQD). INSTALL EACH STRAP IN TWO PIECES WITH ONE END OF EACH PIECE ATTACHED TO A TIEDOWN ANCHOR ON SIDE OF FLATRACK. BRING LOOSE ENDS UP OVER TOP OF STRAPPING BOARD AND SEAL WITH TWO SEALS MARKED ⑧. SECURE IN PLACE BY DRIVING 10d NAILS INTO THE STRAPPING BOARD ON EACH SIDE OF THE STRAP AND BENDING OVER STRAP. STAPLES MAY BE USED IF AVAILABLE. SEE GENERAL NOTE "L" ON PAGE 2 AND THE HOLD-DOWN STRAP THREADING DETAIL ON PAGES 56 AND 57.
- ⑦ EDGE PROTECTOR, STEEL, FOR 2" STEEL STRAPPING (2 REQD). POSITION UNDER STRAP MARKED ④ AT SHARP CORNER OF A-FRAME. IF EDGE PROTECTORS ARE NOT AVAILABLE USE A SHORT PIECE OF 2" STEEL STRAPPING.
- ⑧ SEAL FOR 2" STEEL STRAPPING (40 REQD). FOUR SEALS FOR EACH STRAP MARKED ④, ⑤ AND ⑥. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

TYPICAL AMMUNITION ITEMS

DODIC	ITEM	ITEM QUANTITY	LOAD QUANTITY	TOTAL WEIGHT
M913	CHARGE, DEMO M58A3 83.25 L X 53.75 W X 24.75 H	4	4 CNTRS	11,600 LBS

M58A3 LINEAR DEMOLITION CHARGE (MICLIC)

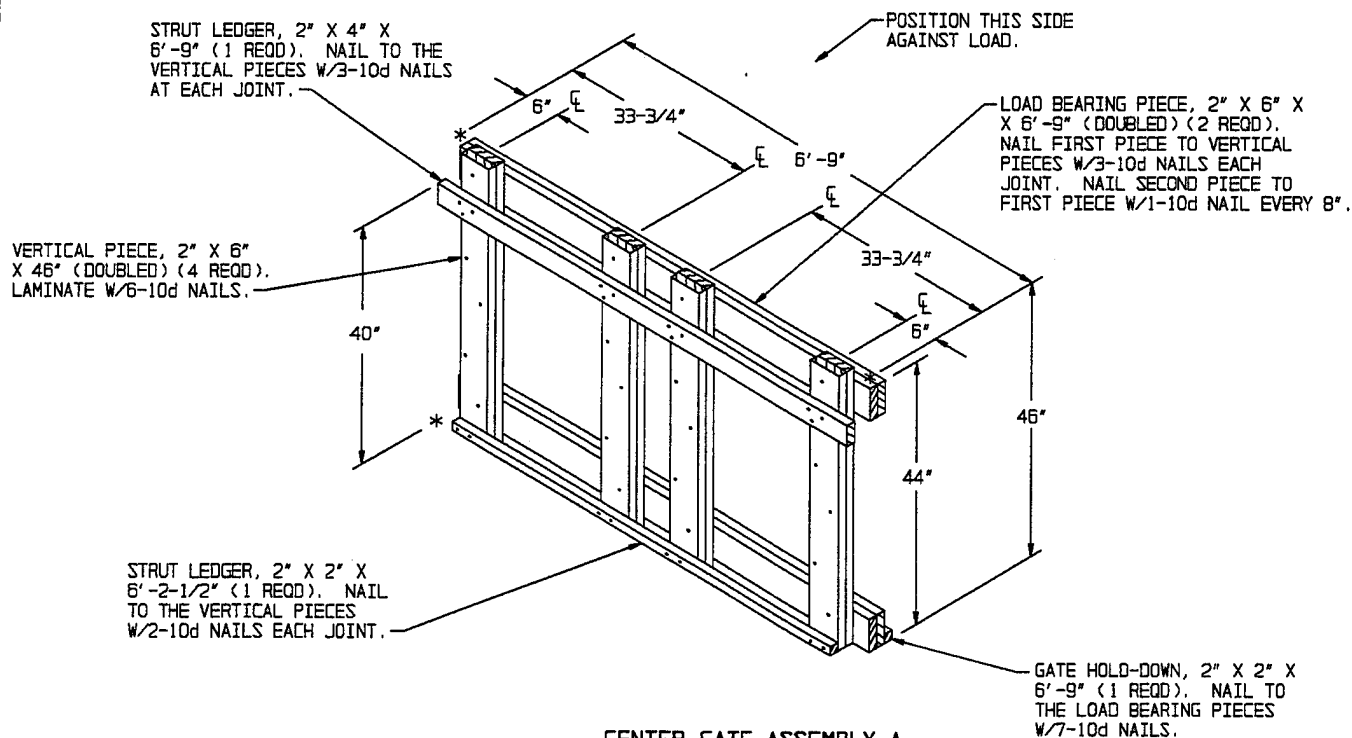
SPECIAL NOTES:

1. A TYPICAL LOAD OF FOUR M58A3 DEMOLITION CHARGES IS SHOWN LOADED ON THE 16-1/2 TON M1077 FLATRACK HAVING CARGO DECK DIMENSIONS OF 7'-6-1/2" WIDE BY 19'-0" LONG AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.
2. THE M58A3 DEMOLITION CHARGE, IN METAL CONTAINERS HAVING DIMENSIONS OF 53-3/4" WIDE BY 6'-11-1/4" LONG BY 24-3/4" HIGH AND WEIGHING 2900 POUNDS, IS SHOWN AS TYPICAL. IF LOADING SIMILAR TYPE CONTAINERS OF OTHER ITEMS, DIMENSIONS, AND WEIGHTS, FOLLOW THESE SAME PROCEDURES AS CLOSELY AS POSSIBLE.
3. PRIOR TO LOADING THE CONTAINERS, ASSURE THAT ALL STEEL STRAPPING ON EACH CONTAINER IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.
4. WHEN LOADING THE FLATRACK, POSITION THE LOAD TIGHT AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATRACK. ALL CONTAINERS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LONGITUDINALLY TO REDUCE LOAD MOVEMENT AND ASSURE A TIGHT LOAD AFTER HOLD-DOWN STEEL STRAPPING IS IN POSITION.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	5	3
2" X 4"	78	52
2" X 6"	106	106
NAILS	NO. REQD	POUNDS
6d (2")	11	NIL
10d (3")	189	3
STEEL STRAPPING, 2" - - - - - 311' REQD - - - 104 LBS		
SEAL FOR 2" STRAPPING - - - - - 40 REQD - - - 8 LBS		
EDGE PROTECTOR FOR 2" STRAPPING - 2 REQD - - - NIL		

LOAD AS SHOWN

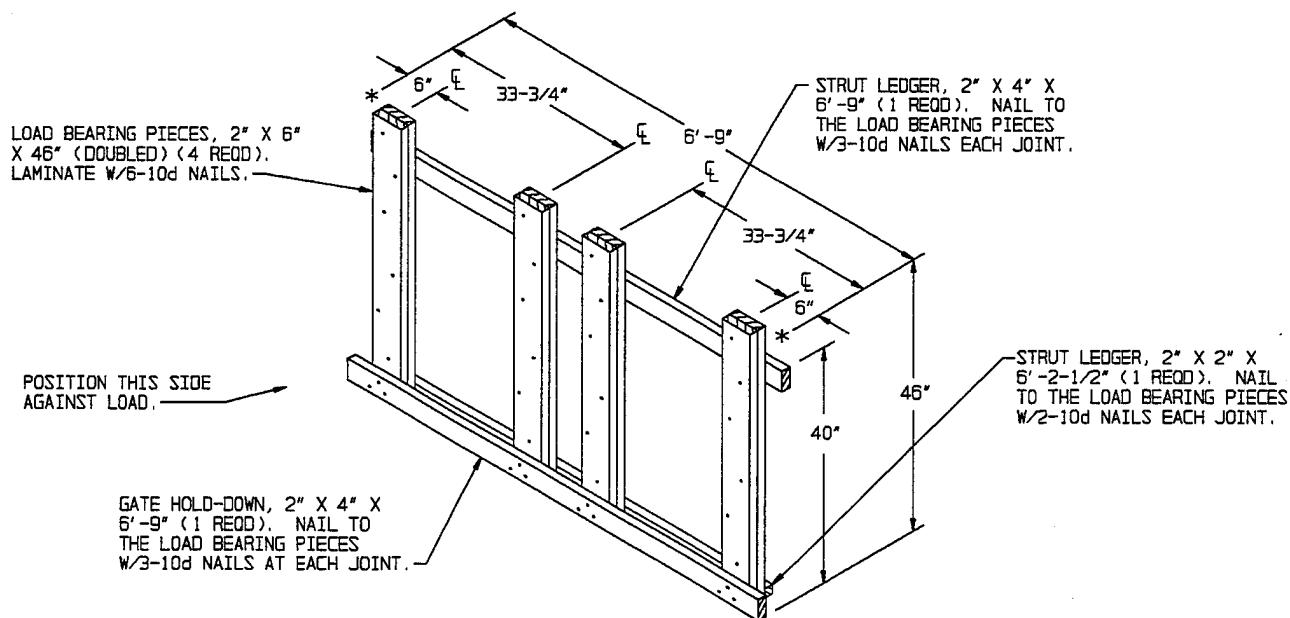
ITEM	QUANTITY	WEIGHT (APPROX)
M58A3 LINEAR DEMOLITION CHARGE	- - - - - 4	- - - - - 11,600 LBS
DUNNAGE	- - - - -	- - - - - 437 LBS
TOTAL WEIGHT		- - - - - 12,037 LBS



CENTER GATE ASSEMBLY A

USED IN THE LOAD ON PAGE 4.

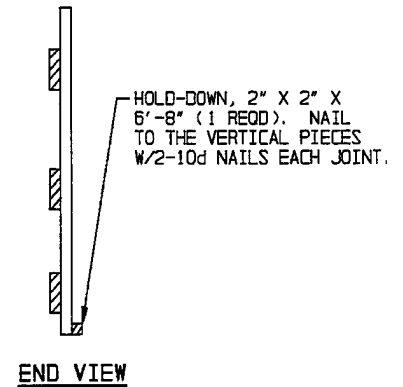
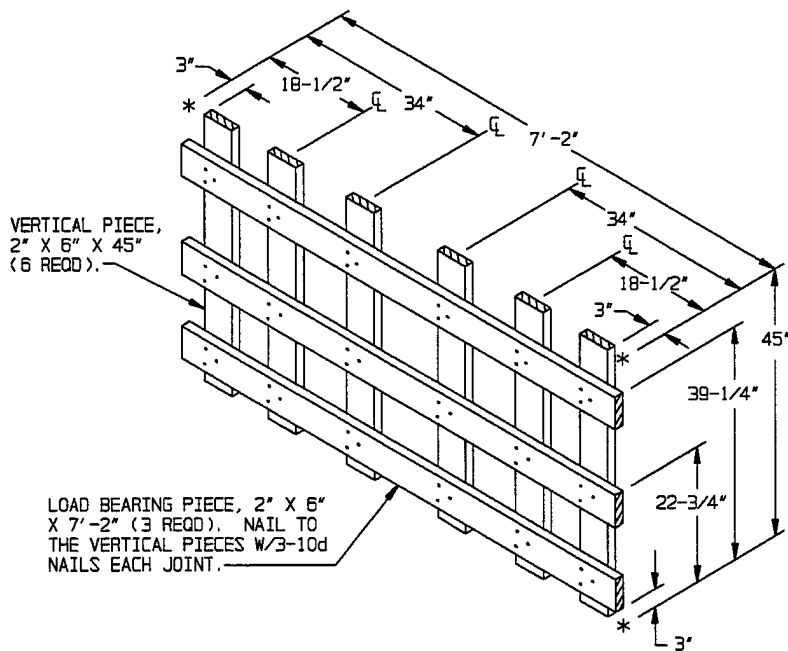
ASSURE THAT EACH VERTICAL PIECE IS IN LONGITUDINAL ALIGNMENT WITH THE LOAD BEARING PIECES ON CENTER GATE ASSEMBLY B.



CENTER GATE ASSEMBLY B

USED IN THE LOAD ON PAGE 4.

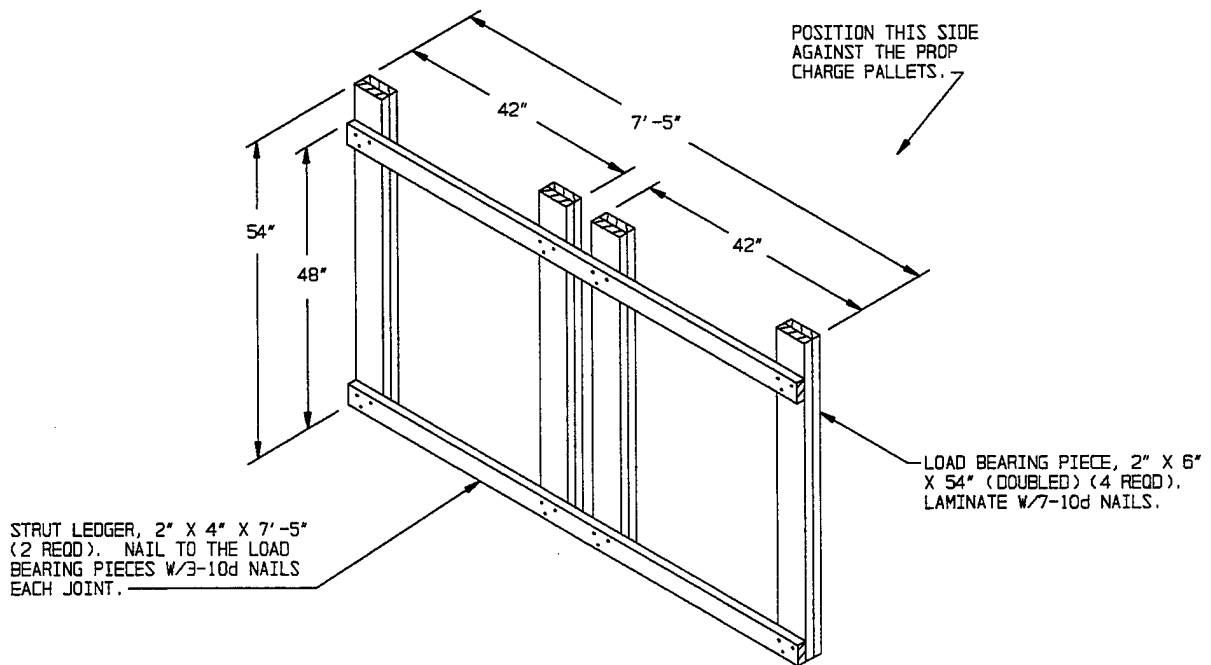
ASSURE THAT EACH LOAD BEARING PIECE IS CENTERED ON THE THREE 3" X 4" INTERMEDIATE DUNNAGE PIECES BETWEEN PROP CHARGE CONTAINERS.



CENTER GATE ASSEMBLY C

USED IN THE LOAD ON PAGE 6.

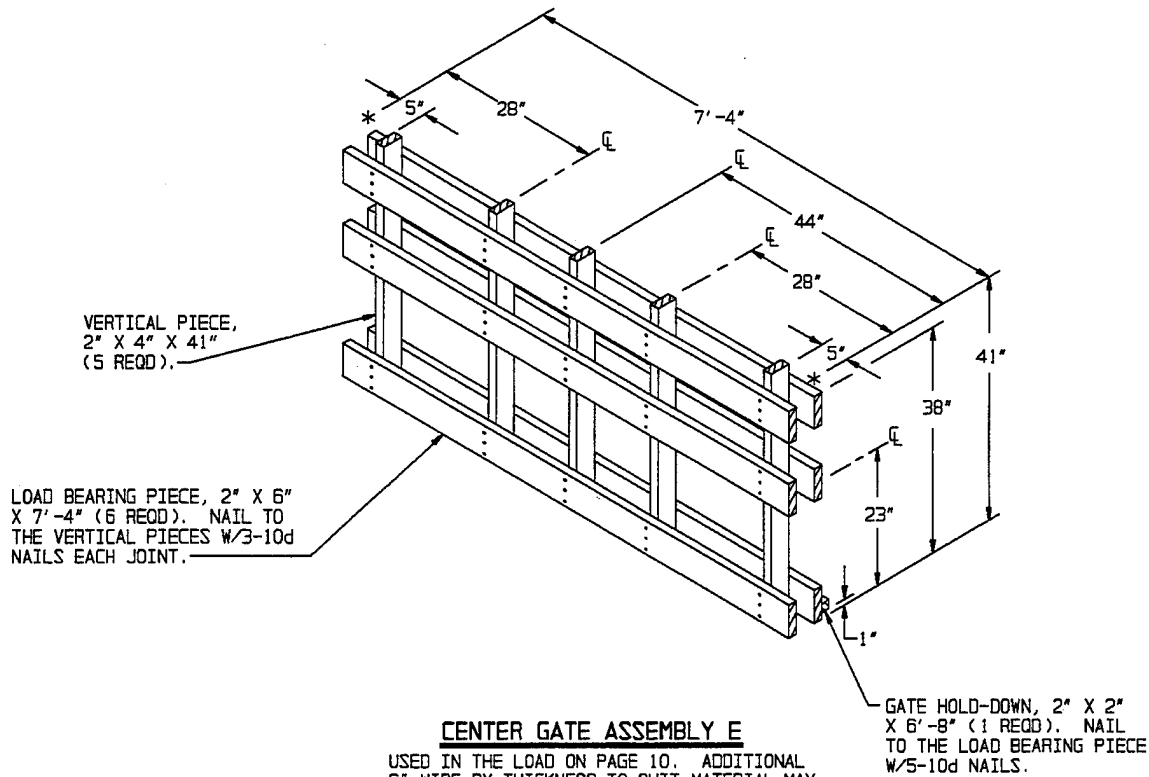
1" THICK MATERIAL MAY BE USED IF CENTER OF LOAD SPACE IS 3" OR LESS. ALSO, ADDITIONAL MATERIAL MAY BE LAMINATED TO THE LOAD BEARING PIECES IF CENTER OF LOAD SPACE IS GREATER THAN 3".



CENTER GATE ASSEMBLY D

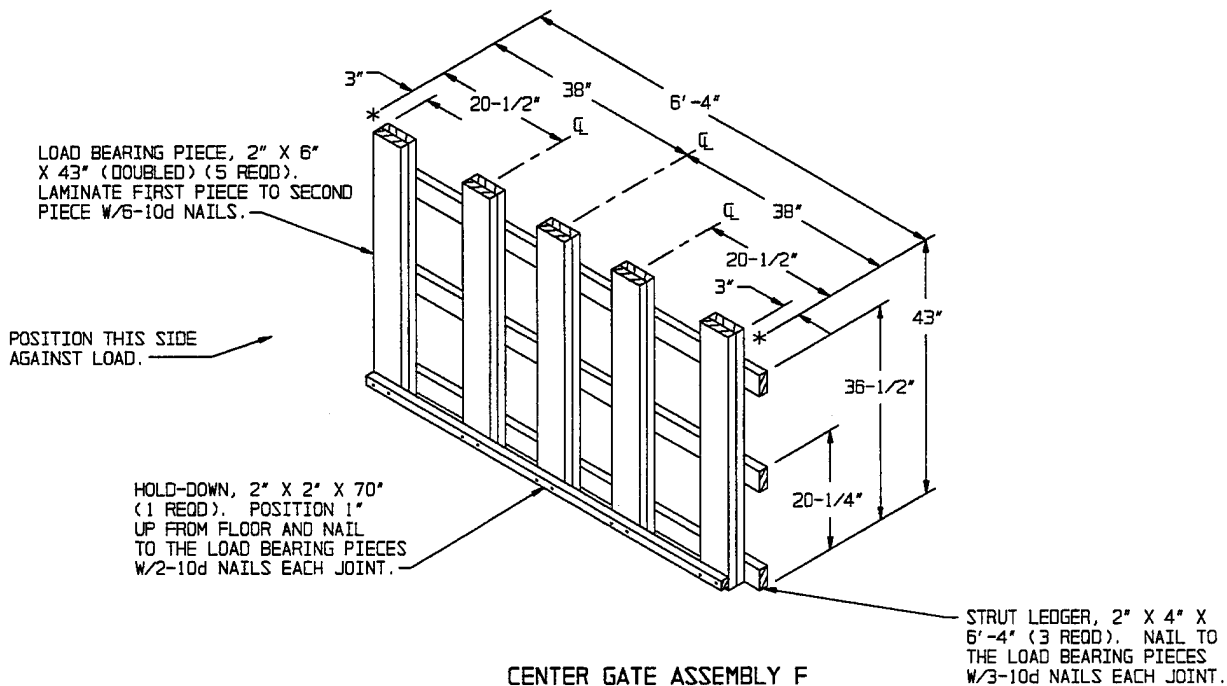
USED IN THE LOAD ON PAGE 8.

DETAILS



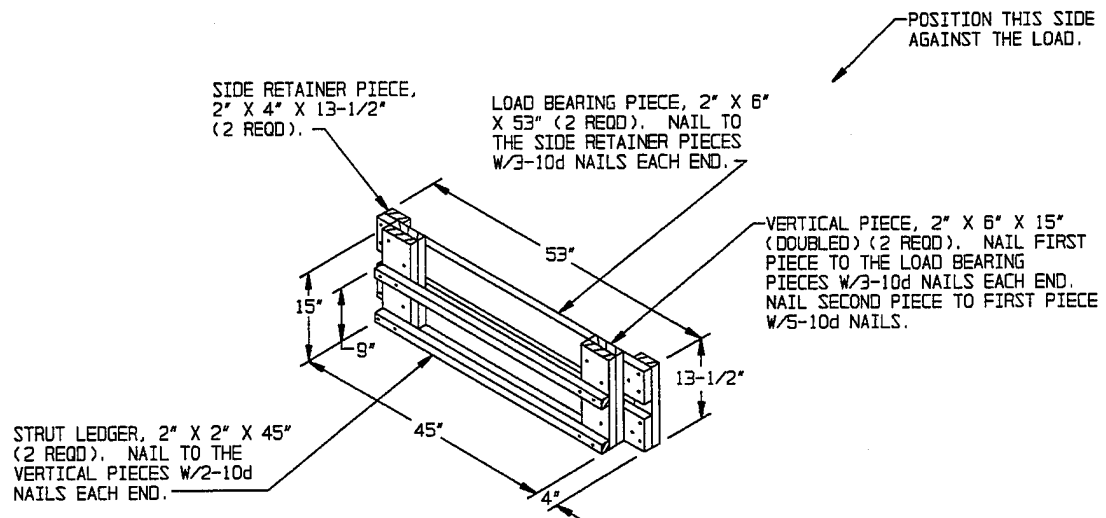
CENTER GATE ASSEMBLY E

USED IN THE LOAD ON PAGE 10. ADDITIONAL 6" WIDE BY THICKNESS-TO-SUIT MATERIAL MAY BE LAMINATED TO THE LOAD BEARING PIECES IF REQUIRED TO ASSURE A TIGHT LOAD.

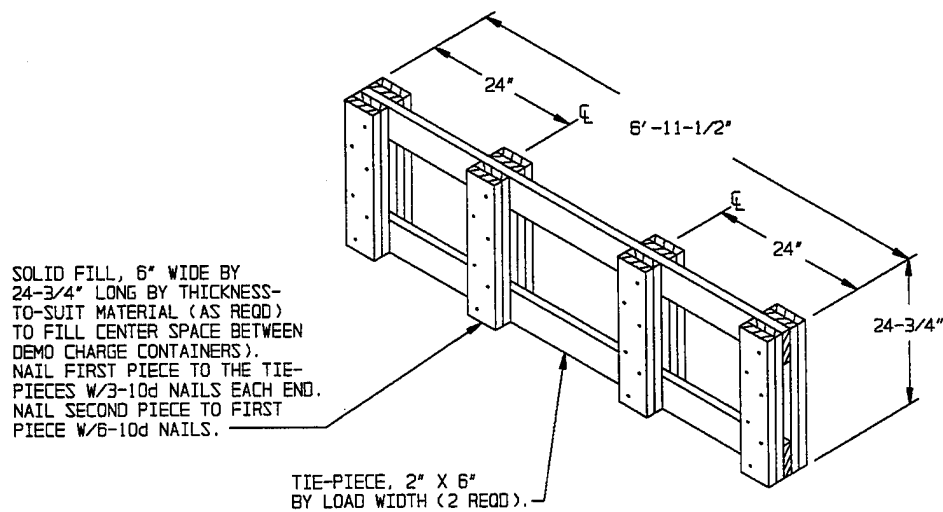


CENTER GATE ASSEMBLY F

USED IN THE LOAD ON PAGE 12.



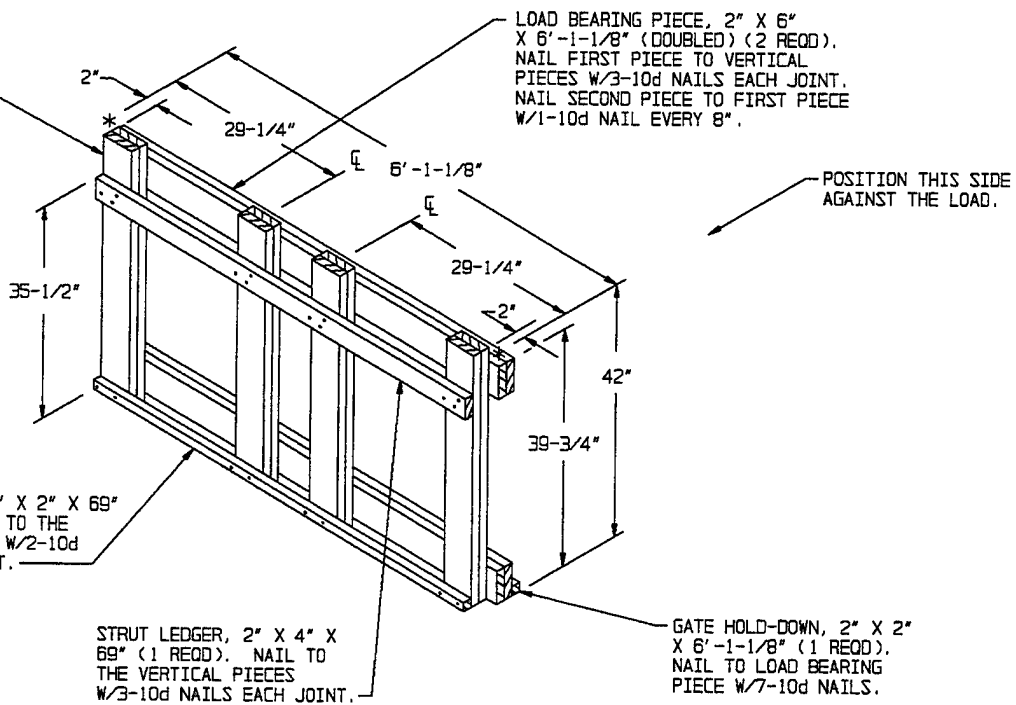
CENTER GATE ASSEMBLY G
USED IN THE LOAD ON PAGE 14.



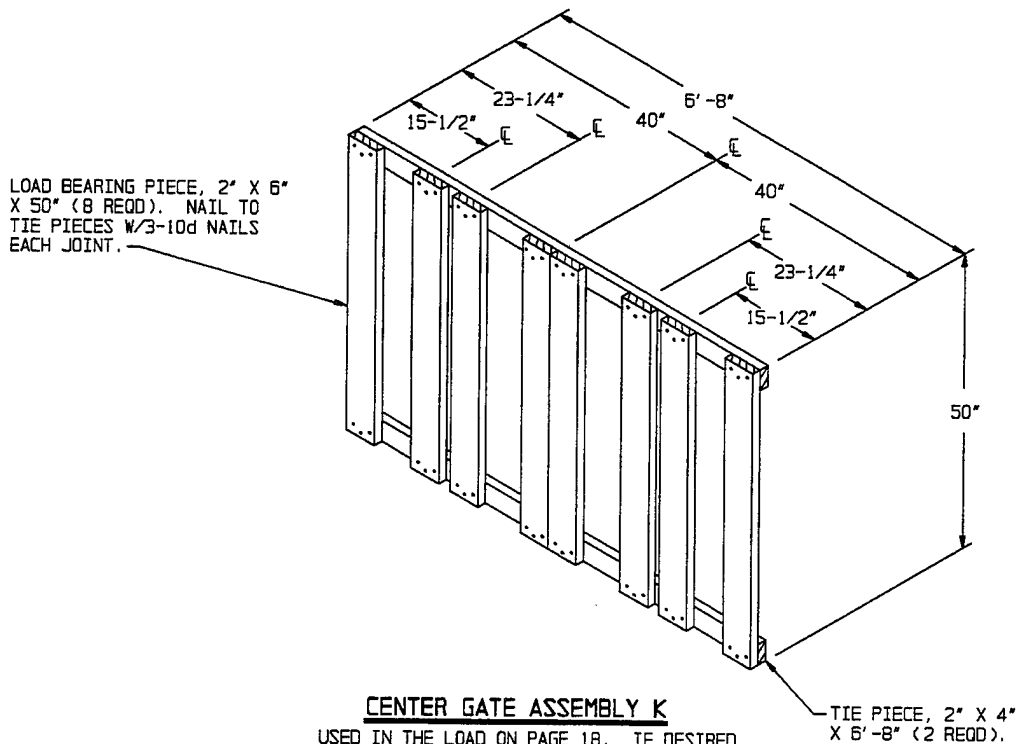
CENTER GATE ASSEMBLY H
USED IN THE LOAD ON PAGE 14.

DETAILS

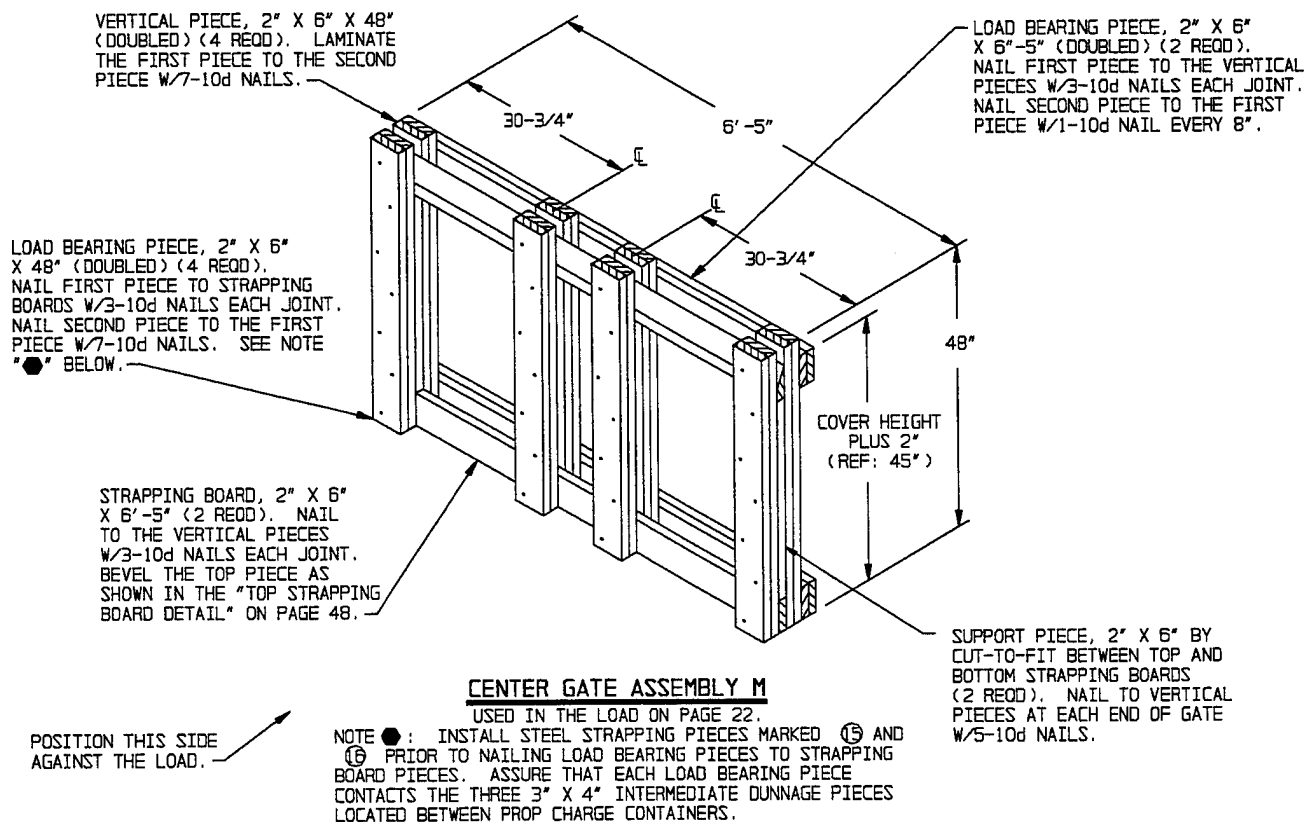
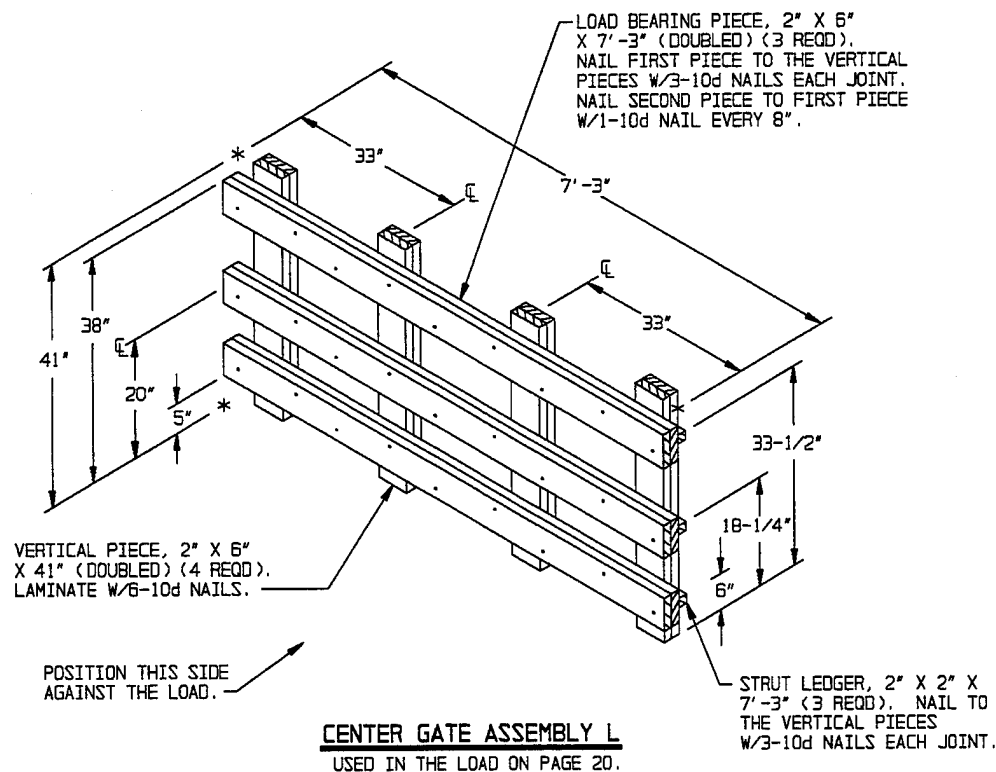
VERTICAL PIECE, 2" X 6"
X 42" (DOUBLED) (4 REQD).
LAMINATE W/5-10d NAILS.



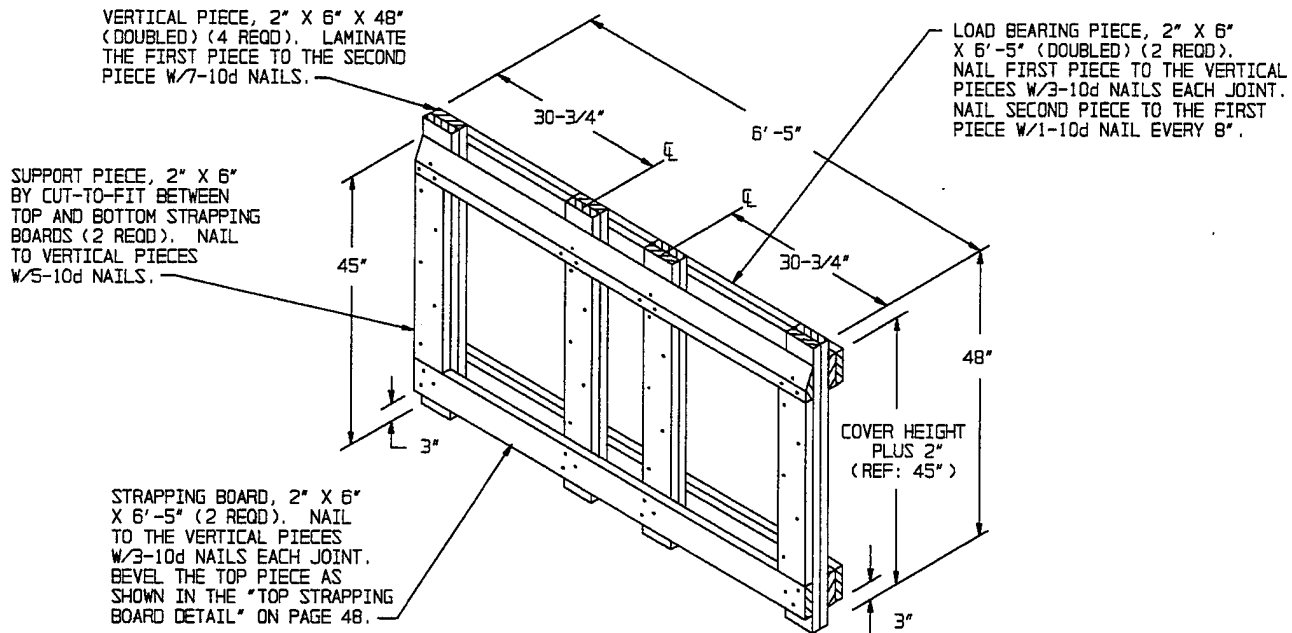
CENTER GATE ASSEMBLY J
(2 REQD)



CENTER GATE ASSEMBLY K
USED IN THE LOAD ON PAGE 18. IF DESIRED,
48" WIDE BY 6'-8" LONG BY THICKNESS-TO-
SUIT PLYWOOD SHEETS MAY BE USED IN LIEU
OF THE CENTER GATE SHOWN ABOVE.



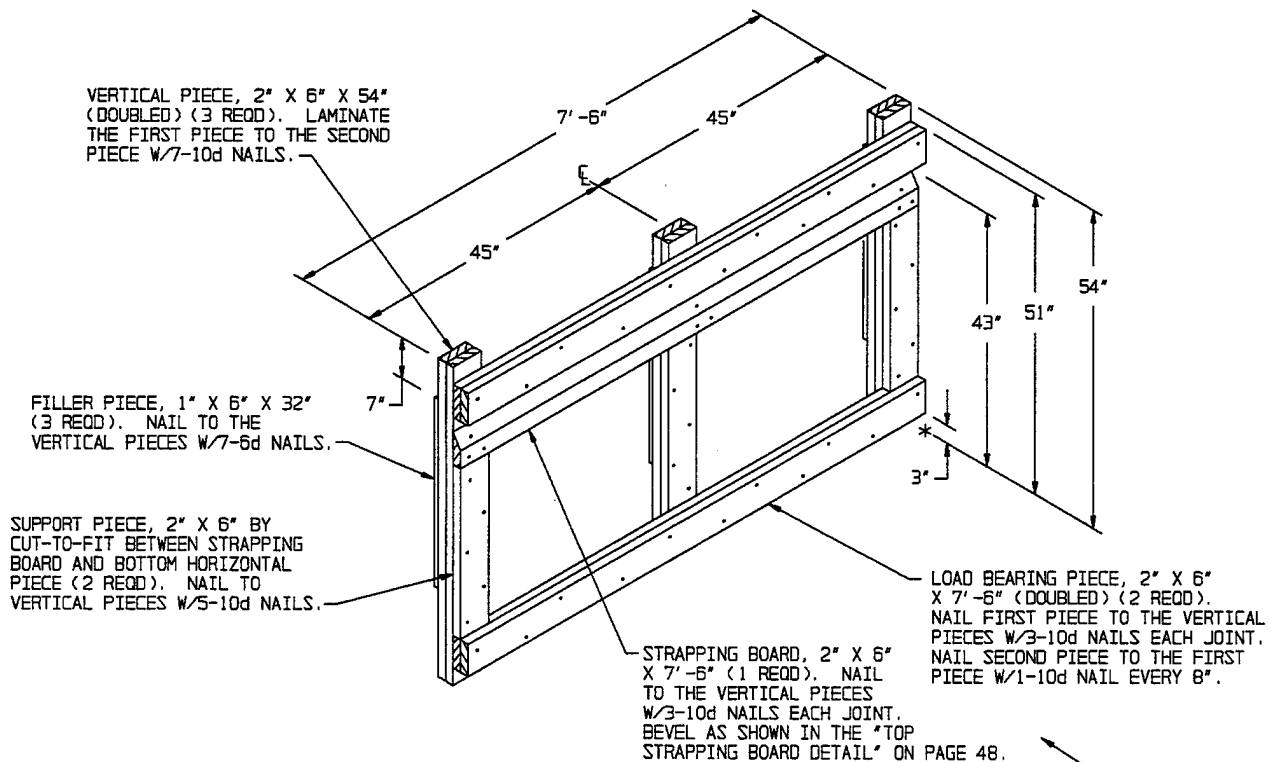
DETAILS



POSITION THIS SIDE TOWARD AFT END OF THE LOAD.

CENTER GATE ASSEMBLY N

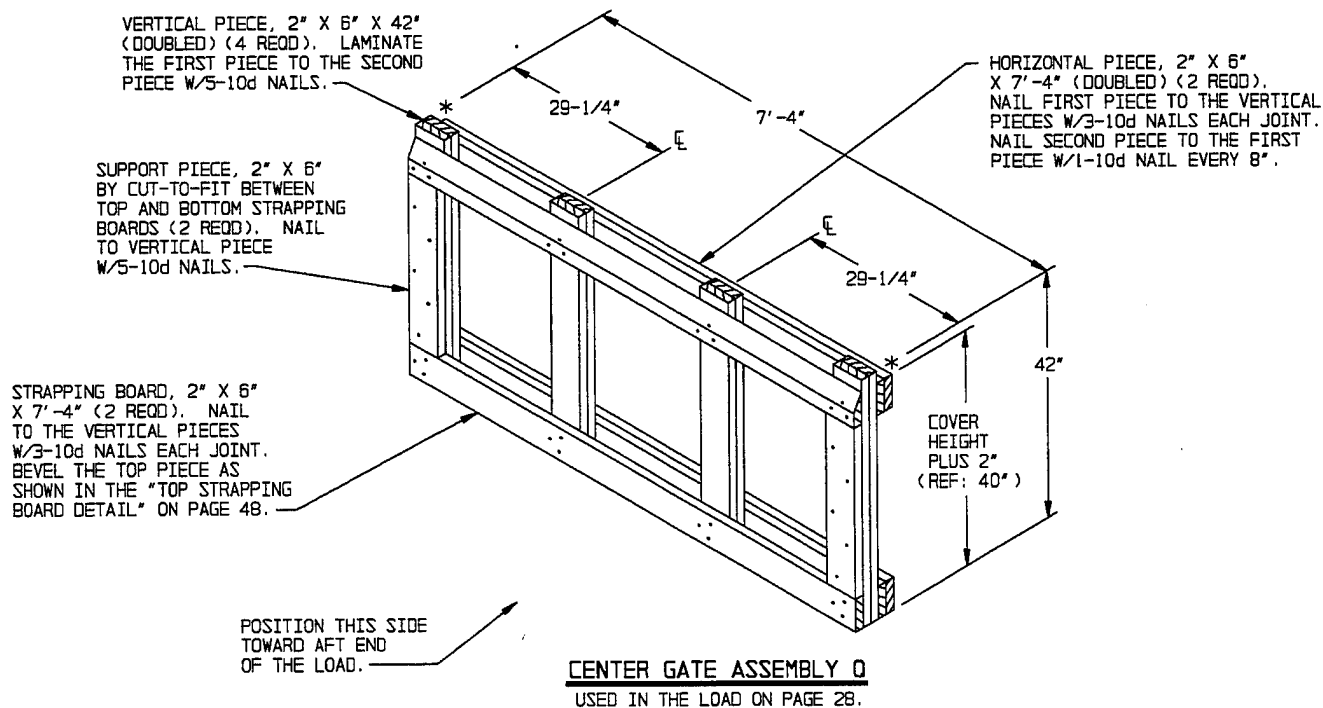
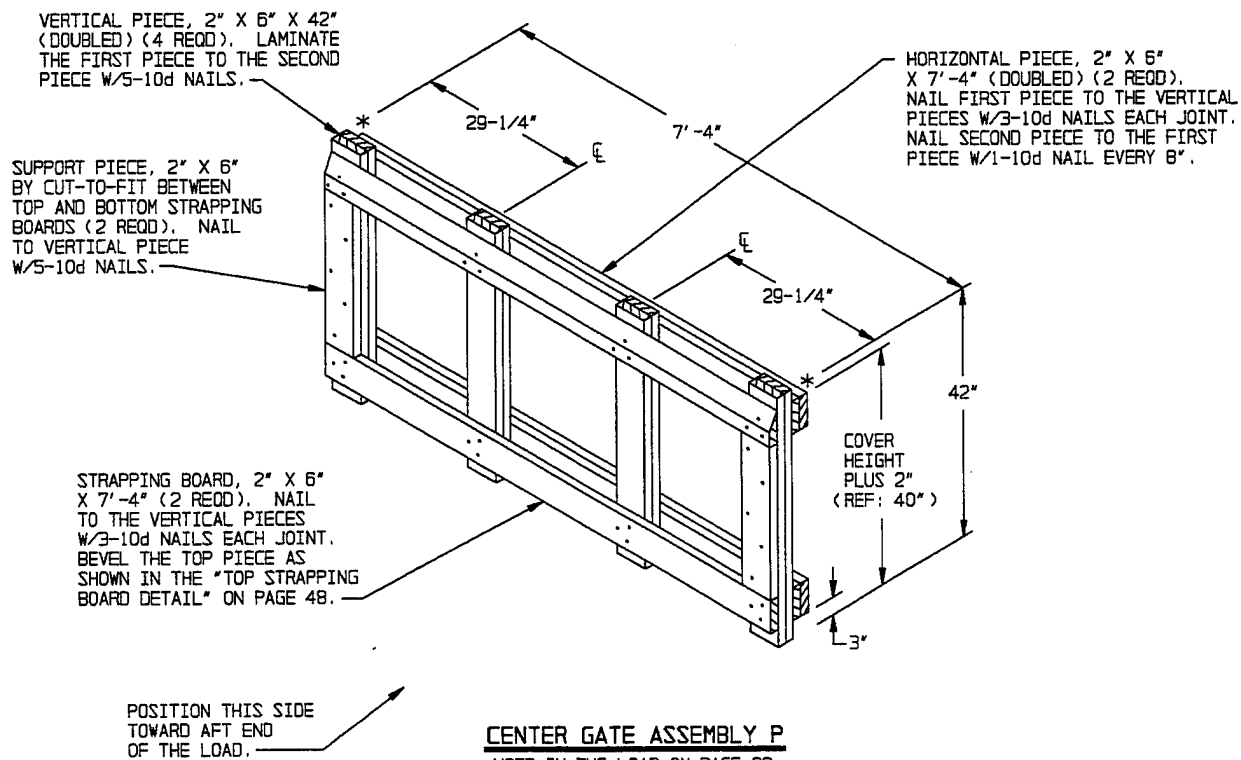
USED IN THE LOAD ON PAGE 22.



POSITION THIS SIDE TOWARD AFT END OF THE LOAD.

CENTER GATE ASSEMBLY O

USED IN THE LOAD ON PAGE 24.



DETAILS

VERTICAL PIECE, 2" X 6" X 43"
(DOUBLED) (6 REQD). LAMINATE
THE FIRST PIECE TO THE SECOND
PIECE W/5-10d NAILS.

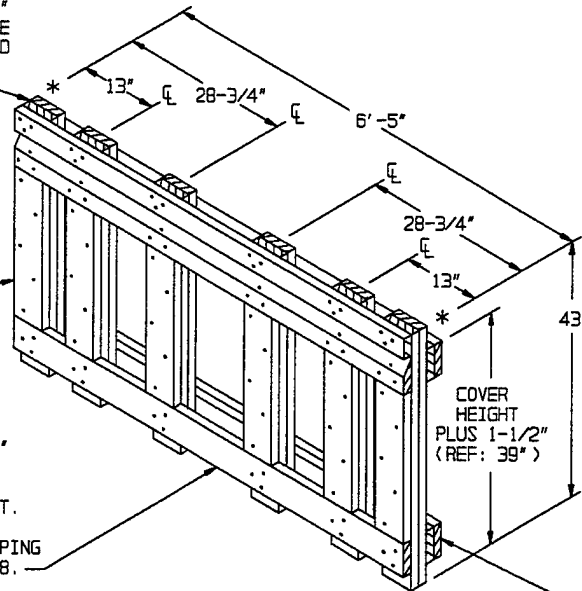
SUPPORT PIECE, 2" X 6"
BY CUT-TO-FIT BETWEEN
TOP AND BOTTOM STRAPPING
BOARDS (6 REQD). NAIL
TO VERTICAL PIECE
W/5-10d NAILS.

STRAPPING BOARD, 2" X 6"
X 6'-5" (2 REQD). NAIL
TO THE VERTICAL PIECES
W/3-10d NAILS EACH JOINT.
BEVEL THE TOP PIECE AS
SHOWN IN THE "TOP STRAPPING
BOARD DETAIL" ON PAGE 48.

POSITION THIS SIDE
AGAINST THE PROP
CHARGE PALLETS.

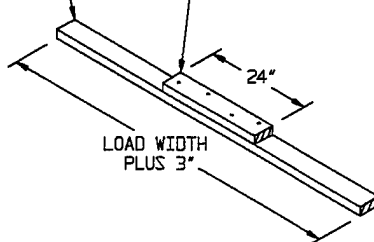
CENTER GATE ASSEMBLY R USED IN THE LOAD ON PAGE 32.

HORIZONTAL PIECE, 2" X 6"
X 6'-5" (DOUBLED) (2 REQD).
NAIL FIRST PIECE TO THE VERTICAL
PIECES W/3-10d NAILS EACH JOINT.
NAIL SECOND PIECE TO THE FIRST
PIECE W/1-10d NAIL EVERY 8".



STRAPPING BOARD, 2" X 4" X
LOAD WIDTH (1 REQD). DO NOT
EXTEND PAST THE EDGE OF
HOLD-DOWN ASSEMBLY ON EACH
SIDE OF THE LOAD.

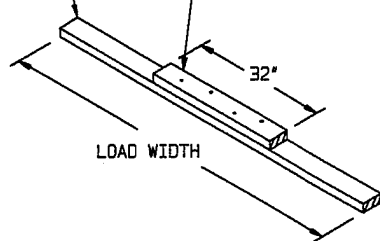
PURCHASE BOARD, 2" X 4"
X 24" (1 REQD). NAIL TO
THE STRAPPING BOARD
W/4-10d NAILS.



STRAPPING BOARD ASSEMBLY A

STRAPPING BOARD, 2" X 4" X
LOAD WIDTH PLUS 3" (1 REQD).
DO NOT EXTEND PAST THE EDGE
OF HOLD-DOWN ASSEMBLY ON EACH
SIDE OF THE LOAD.

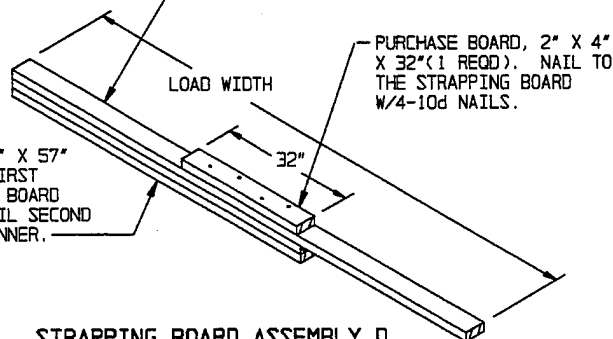
PURCHASE BOARD, 2" X 4"
X 32" (1 REQD). NAIL TO
THE STRAPPING BOARD
W/4-10d NAILS.



STRAPPING BOARD ASSEMBLY C

STRAPPING BOARD, 2" X 4" X
LOAD WIDTH (1 REQD).

PURCHASE BOARD, 2" X 4"
X 32" (1 REQD). NAIL TO
THE STRAPPING BOARD
W/4-10d NAILS.



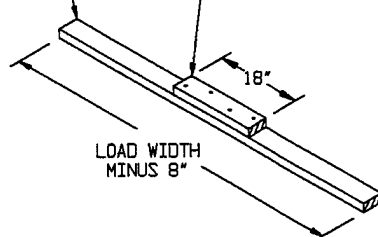
FILL PIECE, 2" X 4" X 57"
(DOUBLED). NAIL FIRST
PIECE TO STRAPPING BOARD
W/5-10d NAILS. NAIL SECOND
PIECE IN A LIKE MANNER.

STRAPPING BOARD ASSEMBLY D

USED IN THE LOAD ON PAGE 10 AND 26.
NOTE THAT THE A974 25MM PALLET IS
2-3/4" HIGHER THAN THE PB93 TOW PALLET.

STRAPPING BOARD, 2" X 4"
X 57" (1 REQD).

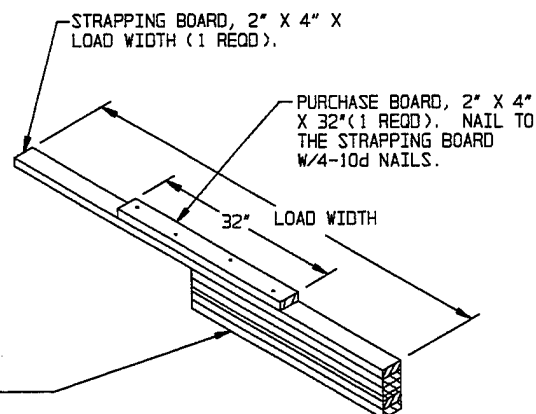
PURCHASE BOARD, 2" X 4"
X 18" (1 REQD). NAIL TO
THE STRAPPING BOARD
W/4-10d NAILS.



STRAPPING BOARD ASSEMBLY E

STRAPPING BOARD, 2" X 4" X
LOAD WIDTH (1 REQD).

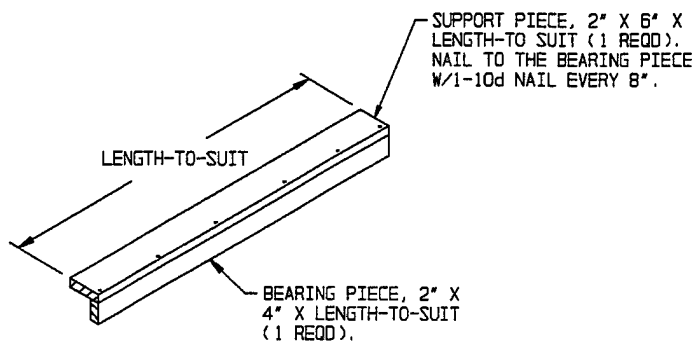
PURCHASE BOARD, 2" X 4"
X 32" (1 REQD). NAIL TO
THE STRAPPING BOARD
W/4-10d NAILS.



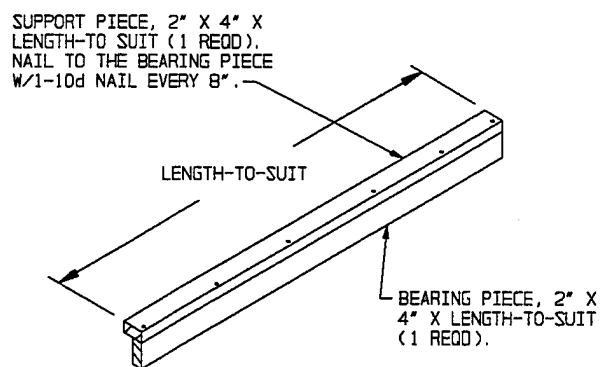
SOLID FILL AS REQUIRED TO
FILL THE VOID SPACE BETWEEN
THE STRAPPING BOARD AND TOP OF
SHORTER PALLET (4 PIECES OF
2" X 4" AND 1 PIECE OF 1" X 4").
NAIL FIRST PIECE TO STRAPPING
BOARD W/5-10d NAILS. NAIL EACH
ADDITIONAL PIECE IN A LIKE MANNER.

STRAPPING BOARD ASSEMBLY F

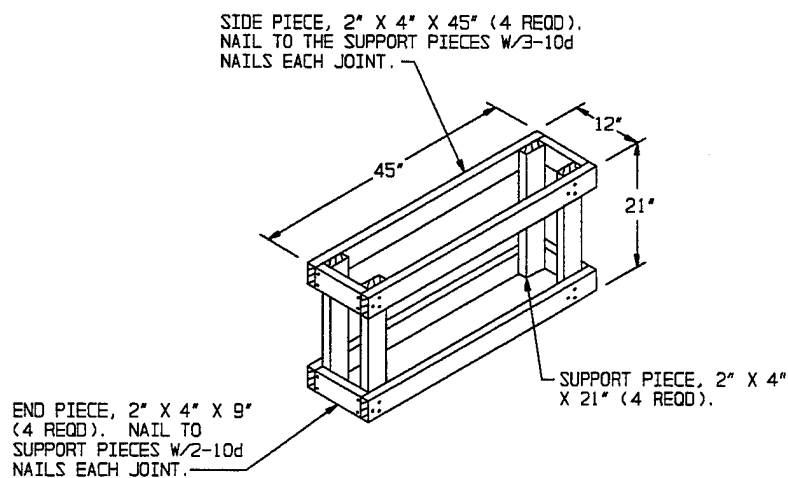
USED IN THE LOAD ON PAGE 20.
FOR USE ON Laterally ADJACENT
PALLETs OF DIFFERENT HEIGHTS.



HOLD-DOWN ASSEMBLY A

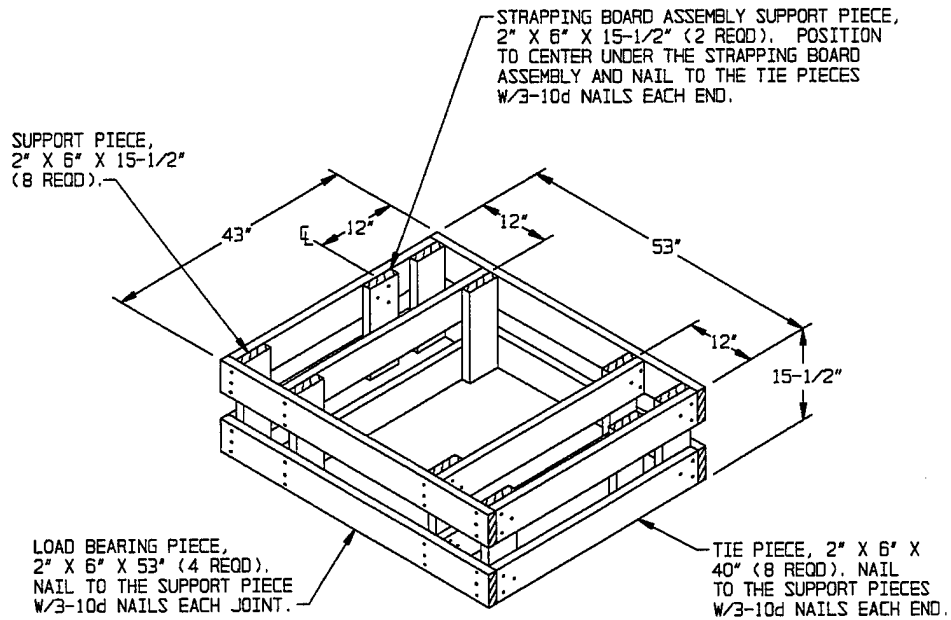


HOLD-DOWN ASSEMBLY B



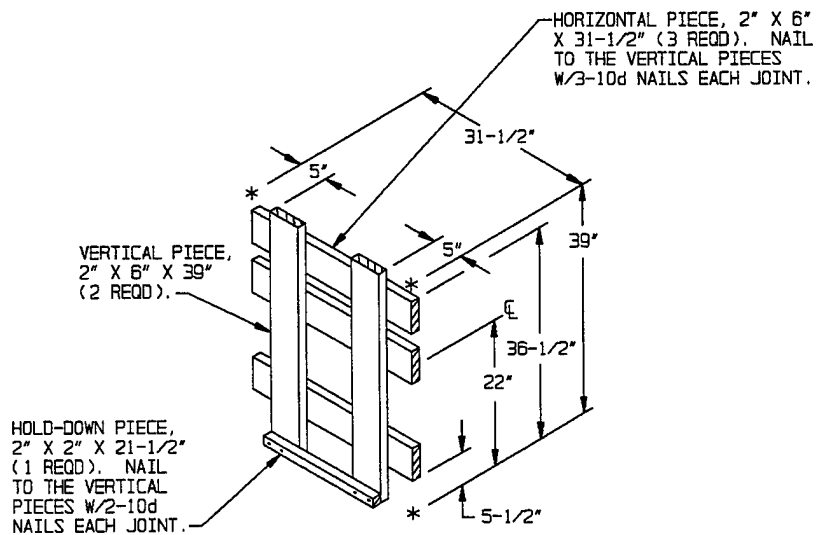
FILLER ASSEMBLY A

USED IN THE LOAD ON PAGE 6. REQUIRED TO
HOLD-DOWN BUNDLE OF NINE M762 FUZE BOXES.



FILLER ASSEMBLY B

USED IN THE LOAD ON PAGE 26.
POSITION THIS ASSEMBLY ON TOP
OF THE 25MM CARTRIDGE PALLET
FOR VERTICAL HOLD-DOWN.



POSITION THIS SIDE
AGAINST THE 25MM PALLET.

FILLER ASSEMBLY C

USED IN THE LOAD ON PAGE 26. REQUIRED
TO FILL VOID SPACE BETWEEN PALLETS FOR
A LONGITUDINALLY TIGHT LOAD.

DETAILS

TIE-PIECE, 2" X 4" X 13"
(1 REQD). NAIL TO 2"
THICK LOAD BEARING PIECES
W/3-10d NAILS EACH END.

LOAD BEARING PIECE,
1" X 4" X 31" (2 REQD).
NAIL TO THE FILLER
AND TIE PIECES
W/4-10d NAILS.

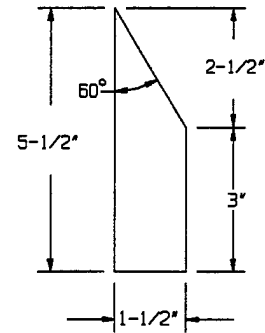
FILLER PIECE, 2" X 4"
X 27-1/2" (2 REQD).
NAIL TO THE 2" X 4"
LOAD BEARING PIECE
W/4-10d NAILS.

LOAD BEARING PIECE,
2" X 4" X 31"
(2 REQD).

HOLD-DOWN PIECE, 2" X 2" X
13" (1 REQD). NAIL TO LOAD
BEARING PIECES W/2-10d NAILS
EACH END.

SPACER ASSEMBLY A

USED IN THE LOAD ON PAGE 6. NOTE THAT THE
D544 PALLETS ARE 27.13" LONG AND THE D563
ARE 29.12" LONG SO A LONGITUDINAL FILL IS
REQUIRED. POSITION ONE SPACER ASSEMBLY
BETWEEN THE FIRST AND SECOND D544 PALLETS
AND ONE SPACER ASSEMBLY BETWEEN THE THIRD
AND FOURTH D544 PALLETS.



END VIEW

TOP STRAPPING BOARD DETAIL

USED ON THE CENTER AND END GATES. TO
PROVIDE A BEARING SURFACE FOR 2" STEEL
STRAPPING POSITIONED AT AN ANGLE OF
APPROXIMATELY 30°.

LOAD BEARING PIECE, 2"
X 6" X 39" (3 REQD).
(3 REQD). NAIL TO
TIE PIECES W/3-10d
NAILS AT EACH JOINT.

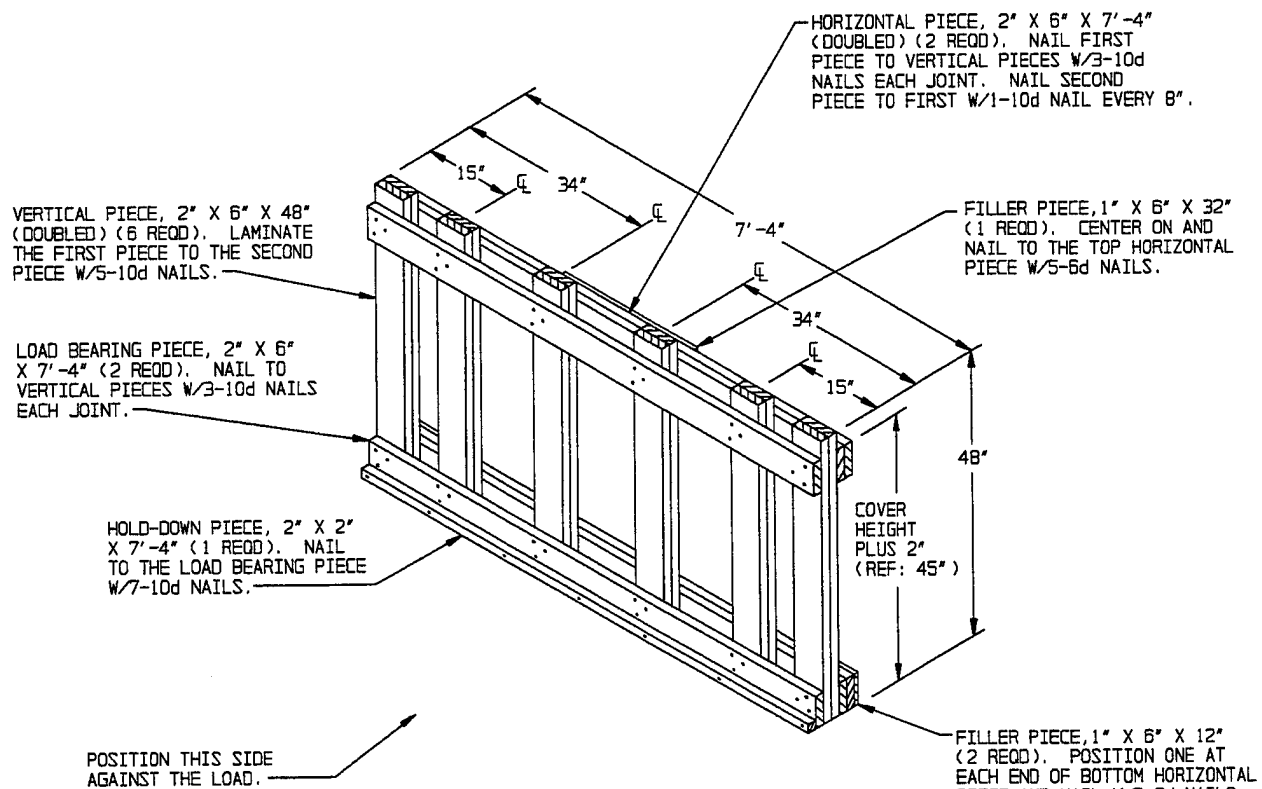
TIE PIECE, 2" X 6"
X 38" (3 REQD).

LOAD BEARING PIECE, 2" X 6" X 39"
(DOUBLED) (3 REQD). NAIL THE
FIRST PIECE TO THE TIE PIECES
W/3-10d NAILS AT EACH JOINT.
NAIL THE SECOND PIECE TO THE
FIRST PIECE W/5-10d NAILS.

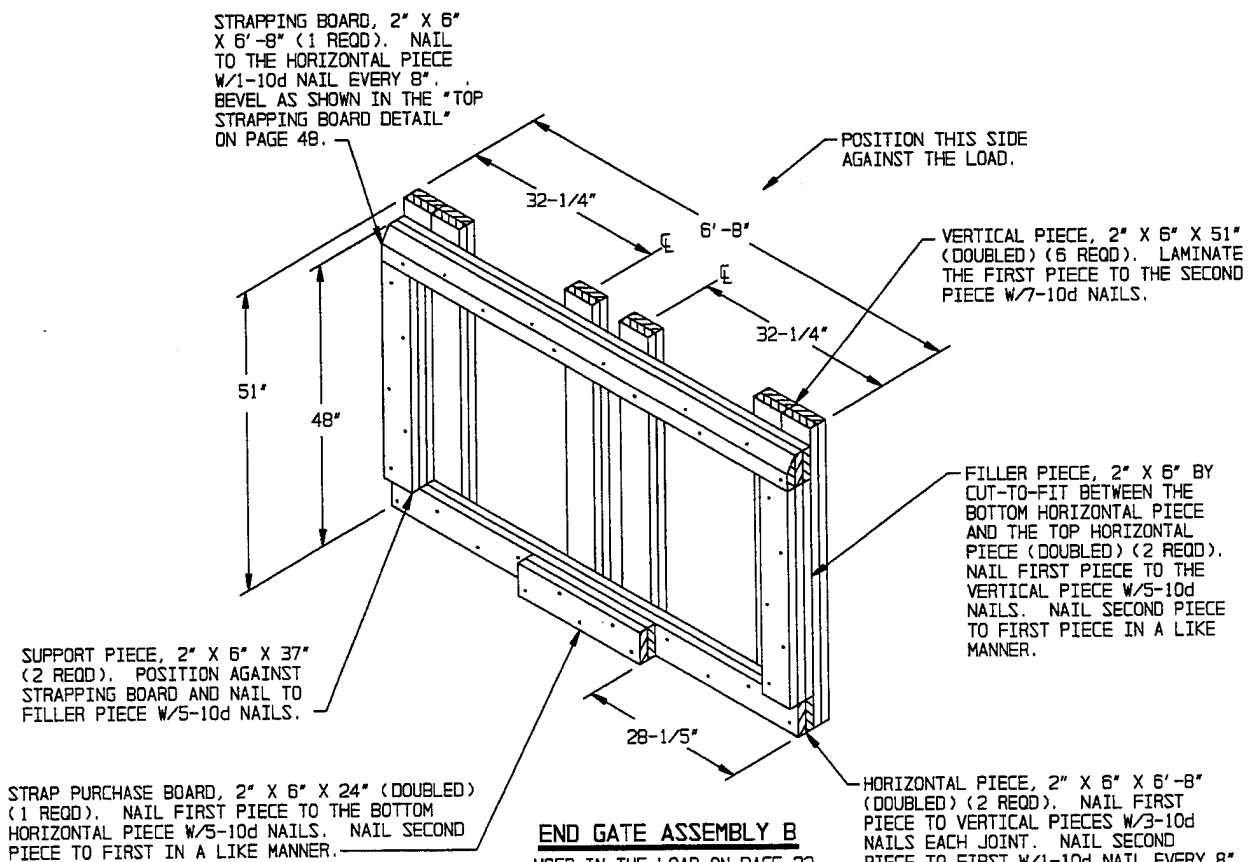
HOLD-DOWN PIECE, 2" X 2" X 38"
(1 REQD). NAIL TO LOAD BEARING
PIECES W/2-10d NAILS EACH JOINT.

SPACER ASSEMBLY B

USED IN THE LOAD ON PAGE 12.

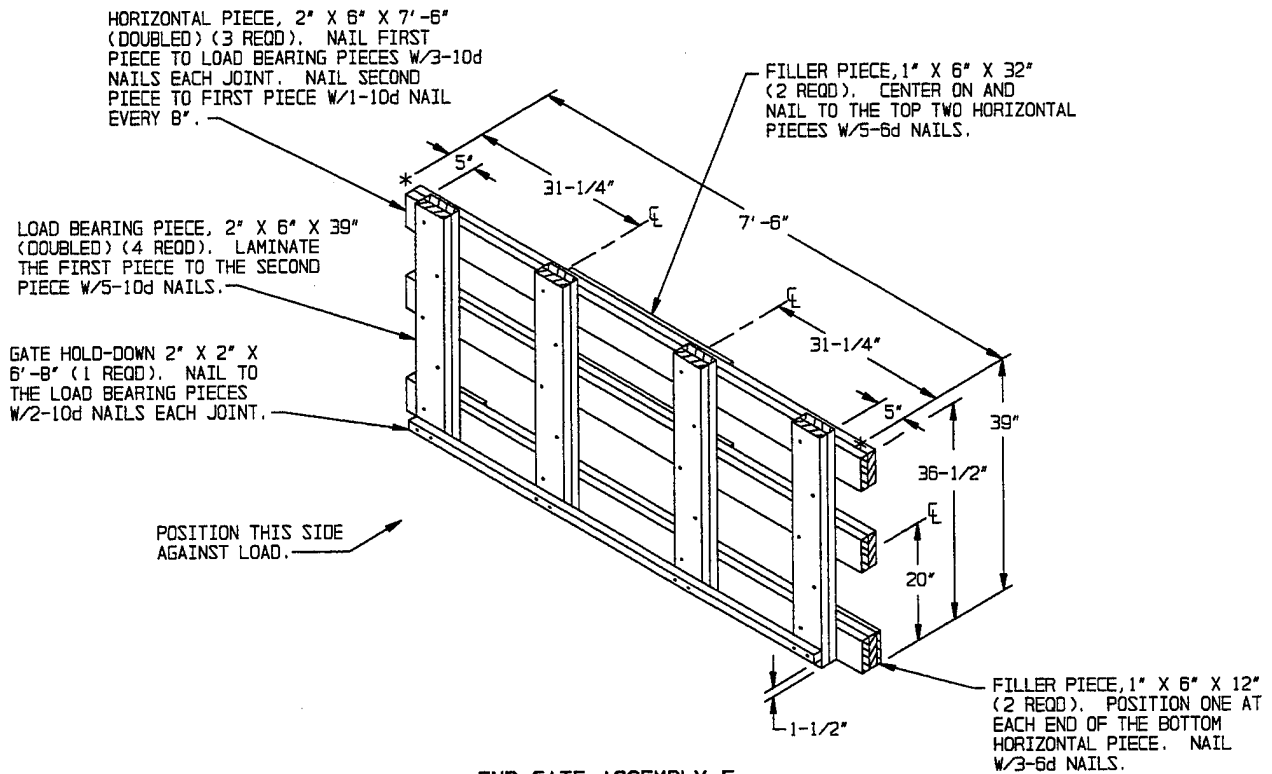


END GATE ASSEMBLY A
USED IN THE LOAD ON PAGE 22.

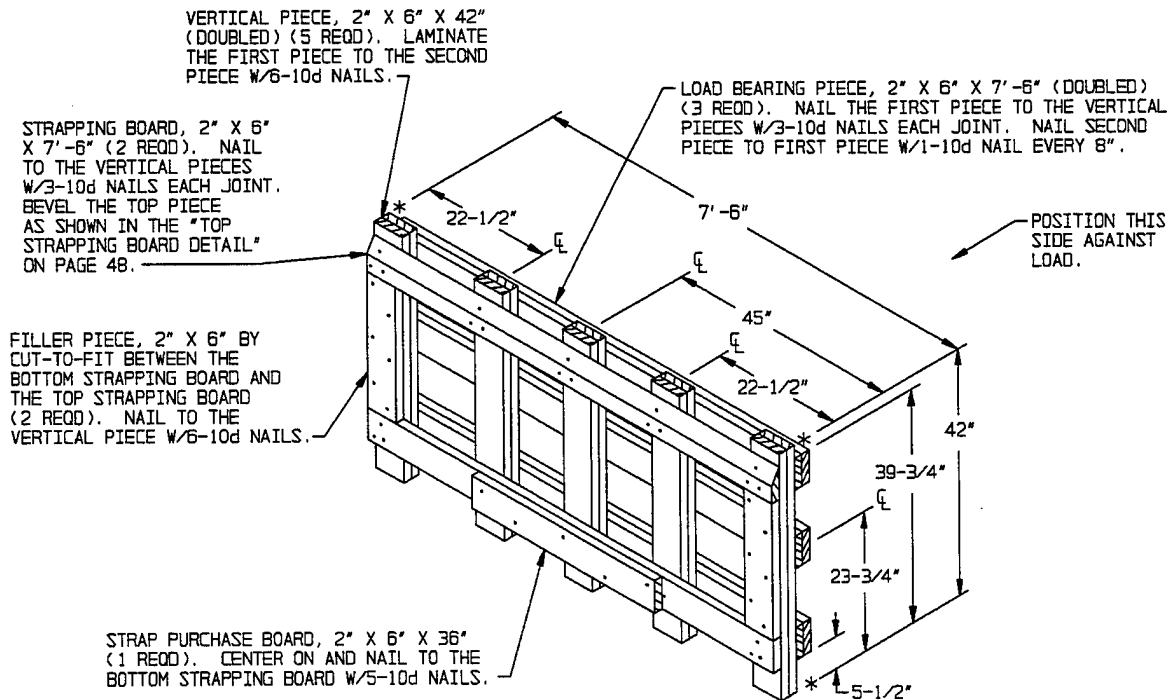


END GATE ASSEMBLY B
USED IN THE LOAD ON PAGE 22.

DETAILS

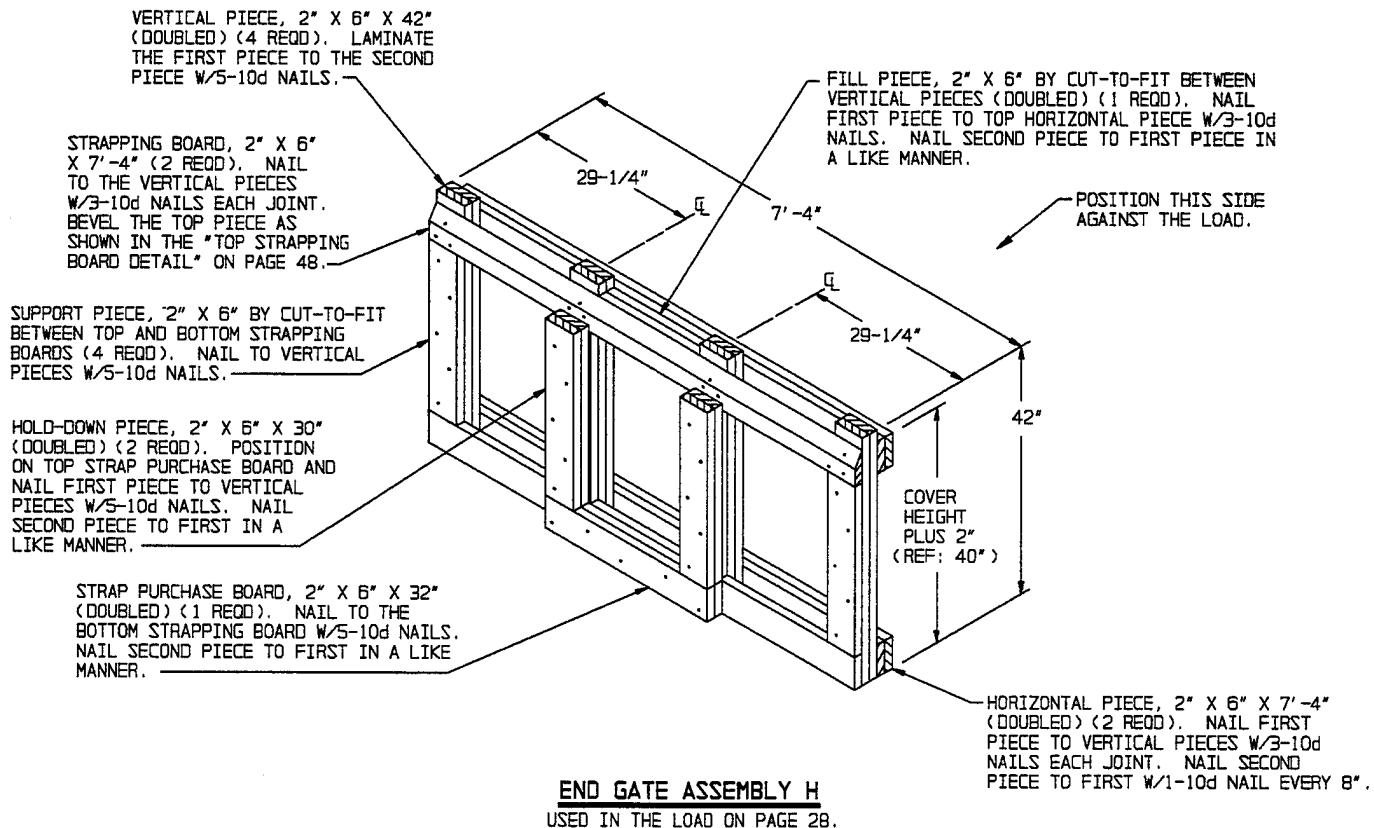
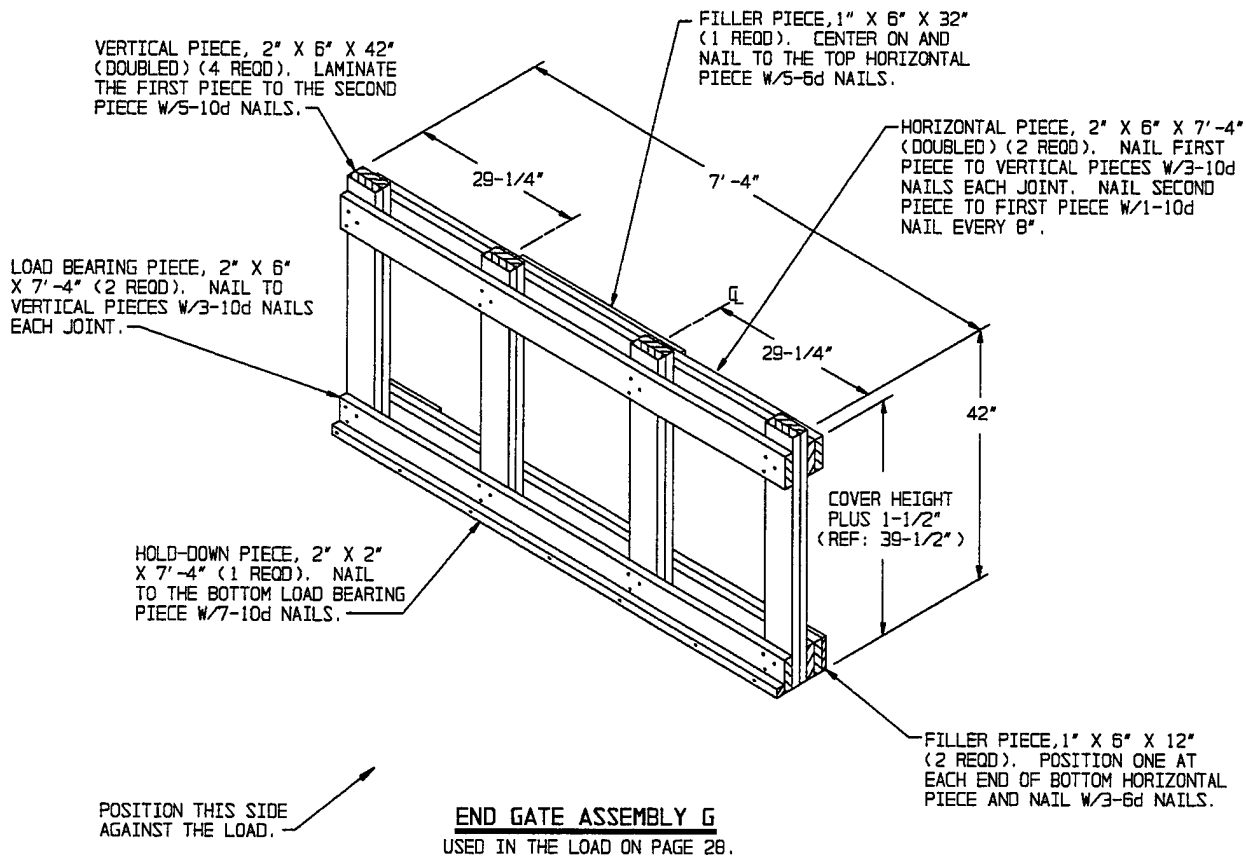


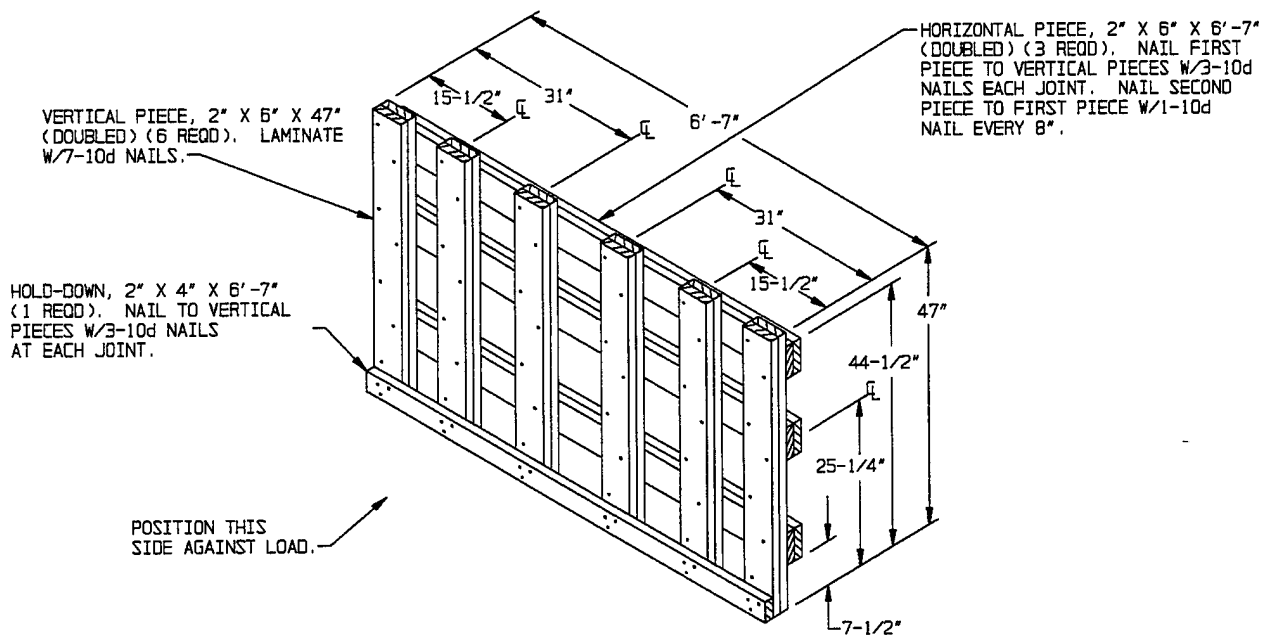
END GATE ASSEMBLY E
USED IN THE LOAD ON PAGE 26.



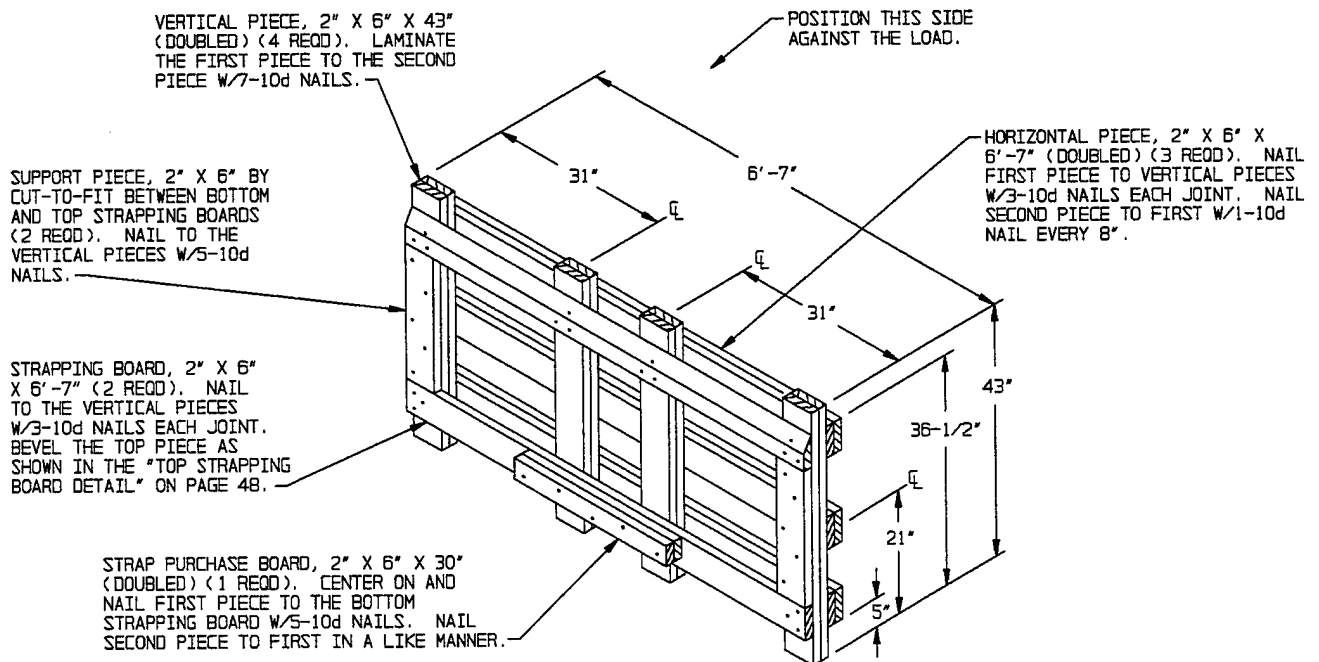
END GATE ASSEMBLY F
USED IN THE LOAD ON PAGE 26.

DETAILS



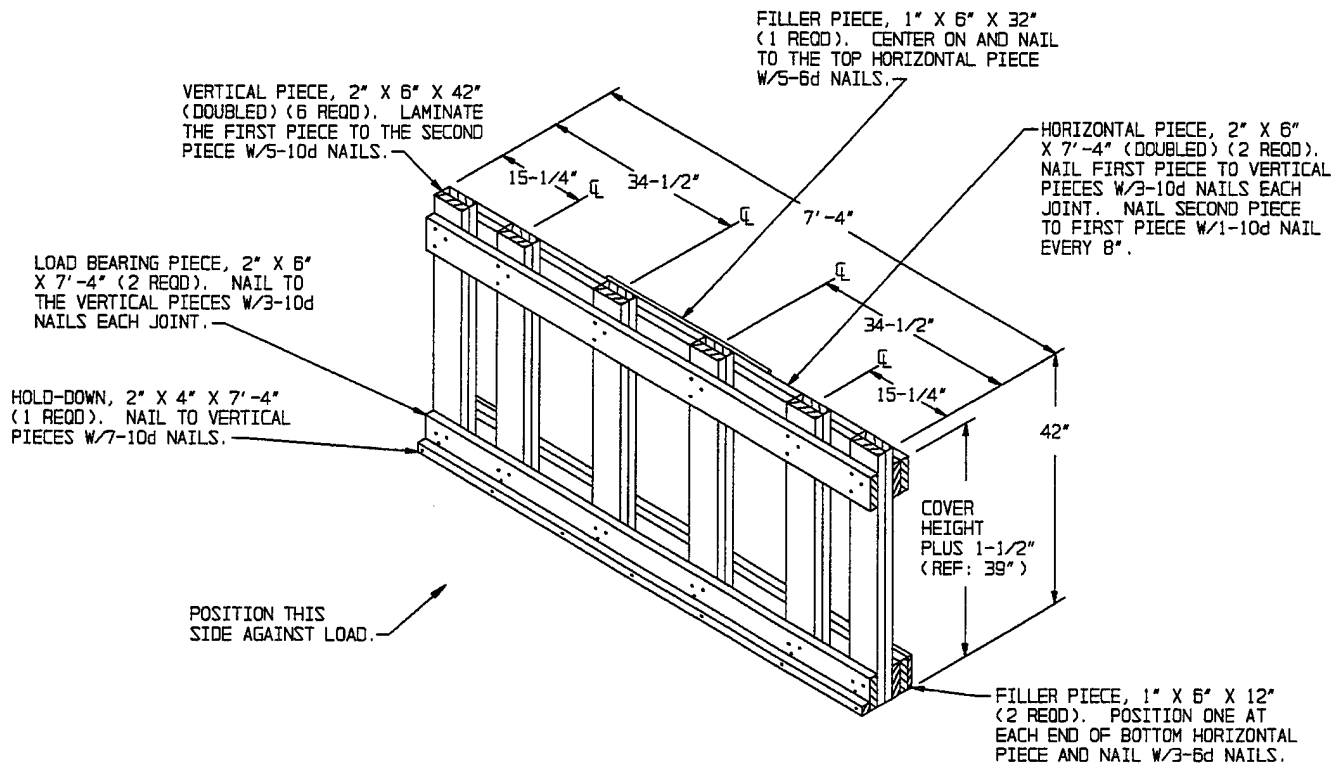


END GATE ASSEMBLY J
USED IN THE LOAD ON PAGE 30.



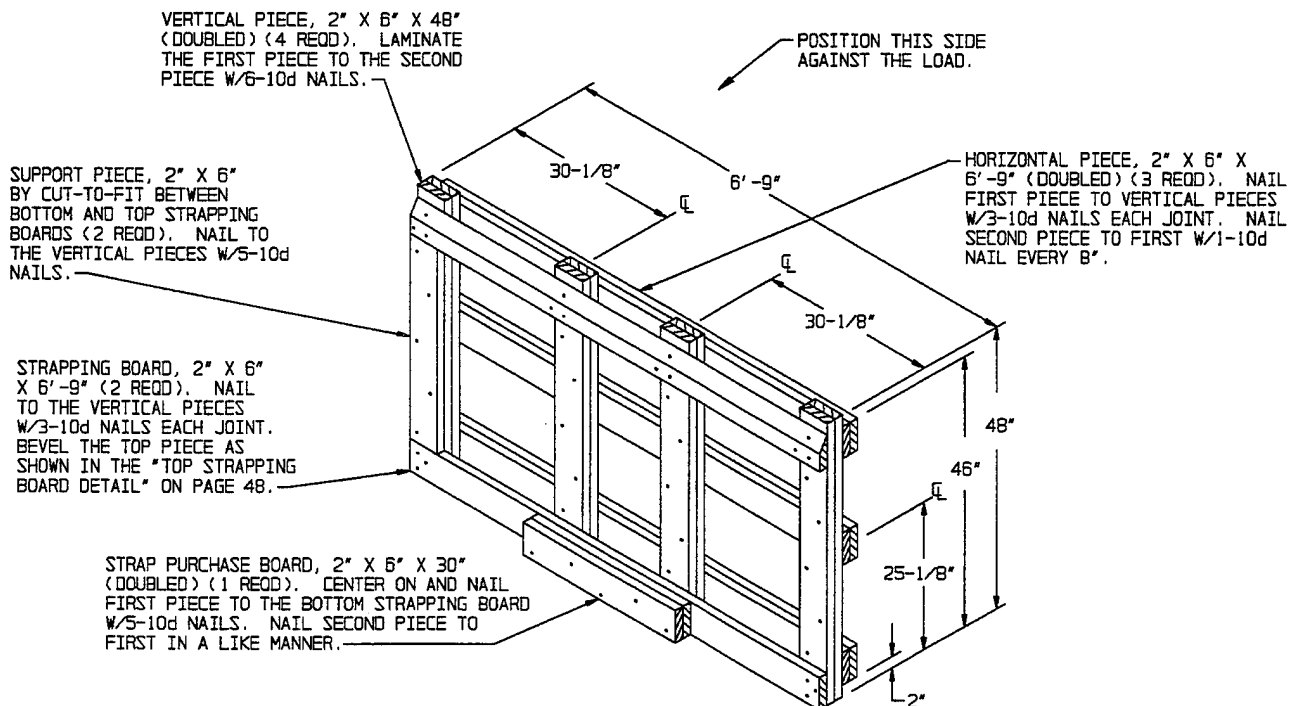
END GATE ASSEMBLY K
USED IN THE LOAD ON PAGE 30.

DETAILS



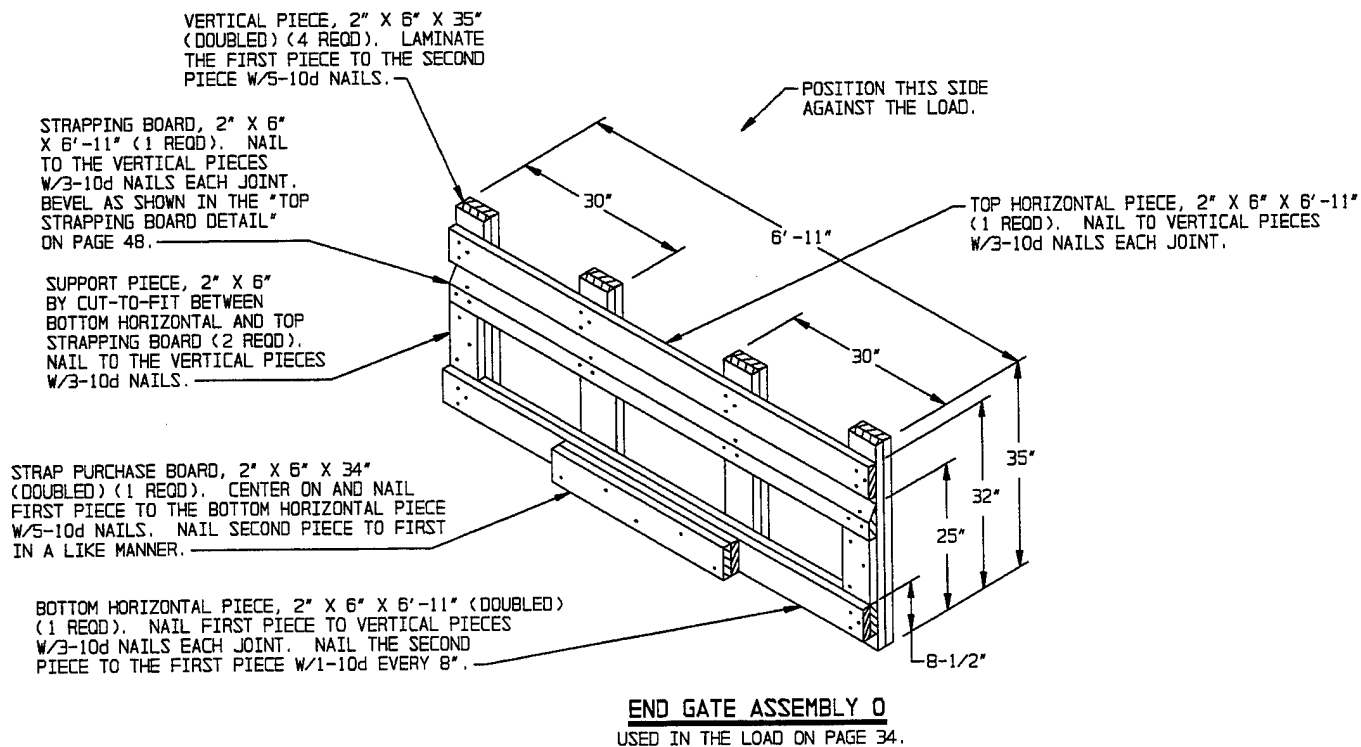
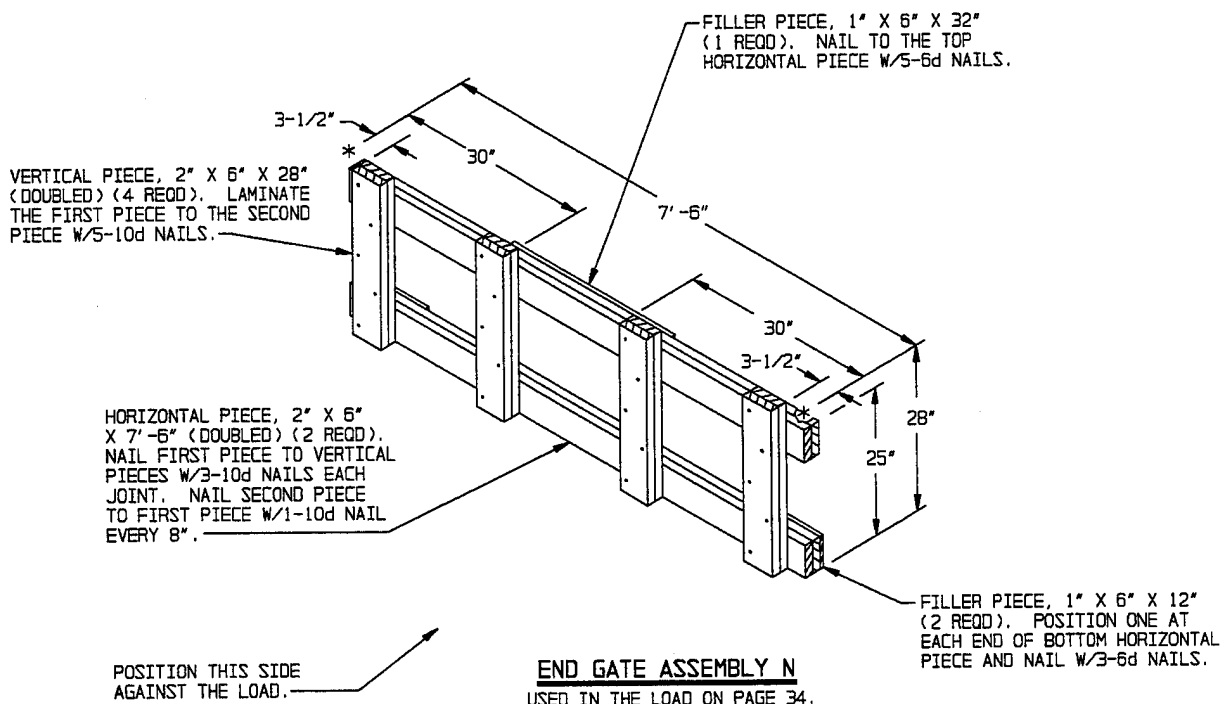
END GATE ASSEMBLY L

USED IN THE LOAD ON PAGE 32.

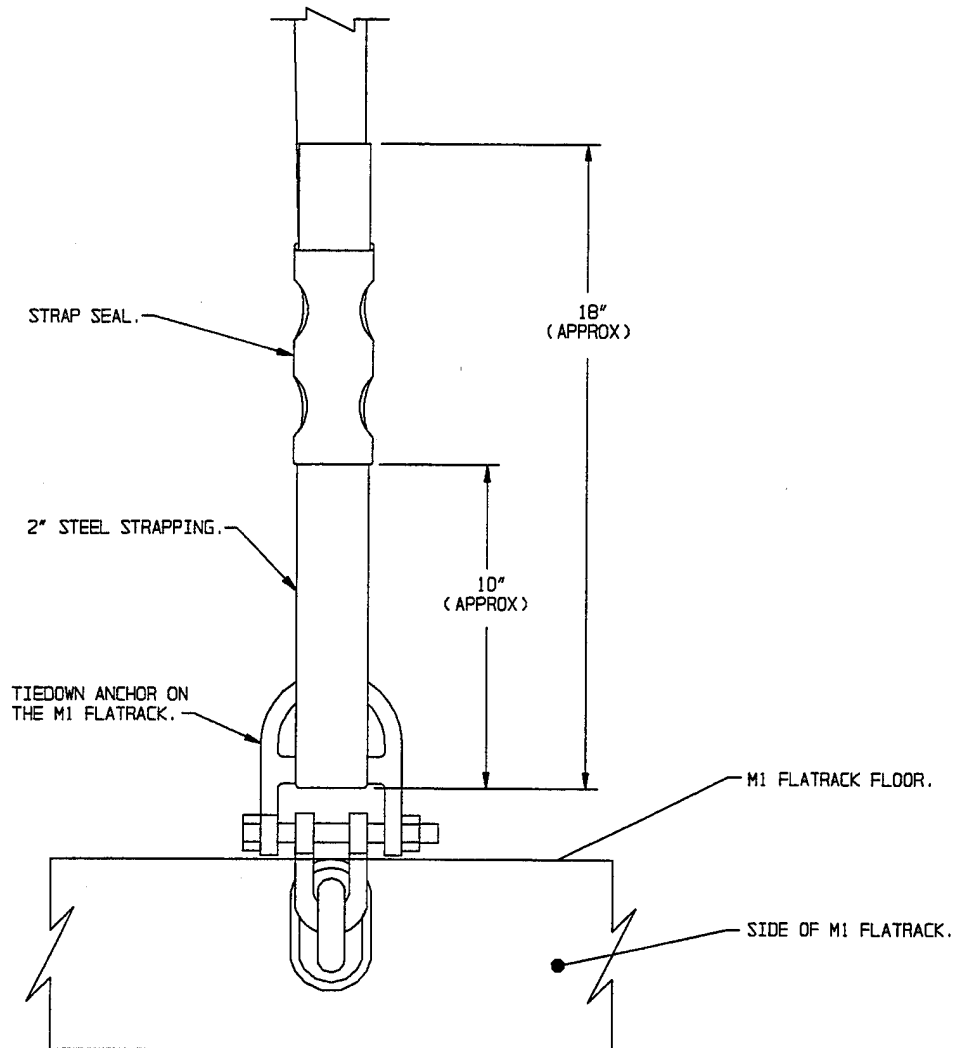


END GATE ASSEMBLY M

USED IN THE LOAD ON PAGE 32.



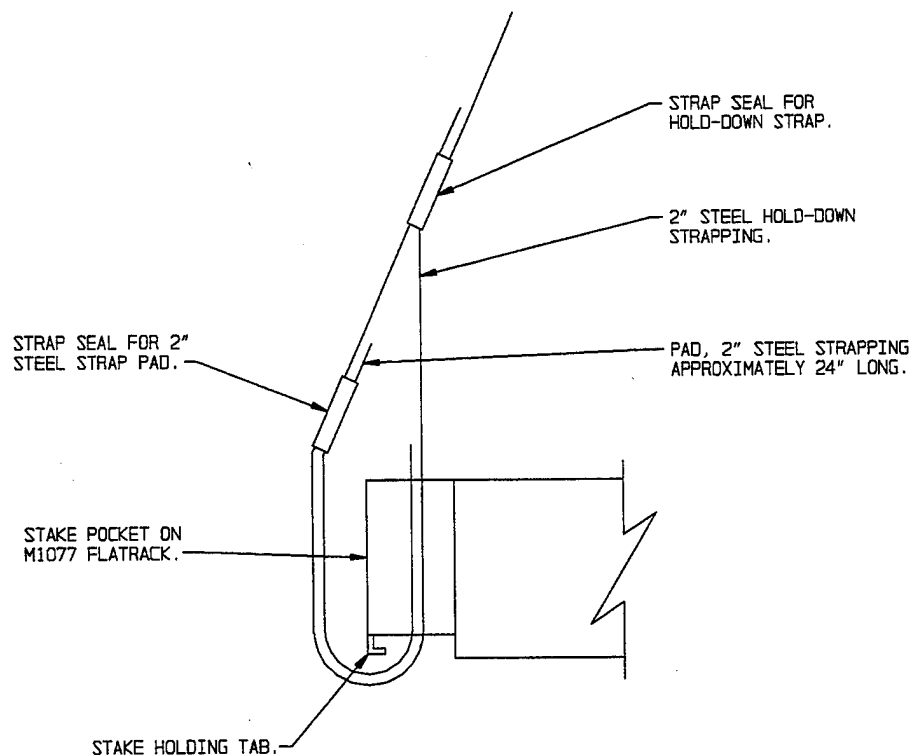
DETAILS



SIDE VIEW

**HOLD-DOWN STRAP THREADING DETAIL
FOR THE M1 AND/OR A-FRAME FLATRACK**

THREAD ONE END OF THE 2" STEEL STRAPPING UNDER THE CENTER BAR OF THE TIEDOWN ANCHOR ON THE M1 FLATRACK AS SHOWN, OR THREAD ONE END OF THE 2" STEEL STRAPPING THROUGH THE STRAPPING SLOT OF THE TIEDOWN ANCHOR ON THE M1077 FLATRACK. BEND A LENGTH OF APPROXIMATELY 18" UP AND SLIDE ONE 2" STRAP SEAL DOWN OVER END AND DOUBLE CRIMP SEAL. WHEN RATCHETING THE 2" STEEL STRAPPING TIGHT ASSURE THAT THE TIEDOWN ANCHOR IS IN THE UP POSITION, NOT BINDING ON ANYTHING, AND IN STRAIGHT ALIGNMENT WITH THE PULL OF THE STRAP. NOTE THAT THE DESIGN OF THE DESIGN OF THE TIEDOWN ANCHOR ALLOWS IT TO SWIVEL SO 2" STEEL STRAPPING CAN BE POSITIONED STRAIGHT OVER TOP OF LOAD OR AT AN ANGLE TO RETAIN THE LOAD LONGITUDINALLY. THE TIEDOWN ANCHOR FOR THE M1 FLATRACK IS SHOWN. HOWEVER, THE SAME PROCEDURE CAN BE USED FOR THE TIEDOWN ANCHOR ON THE M1077 FLATRACK.

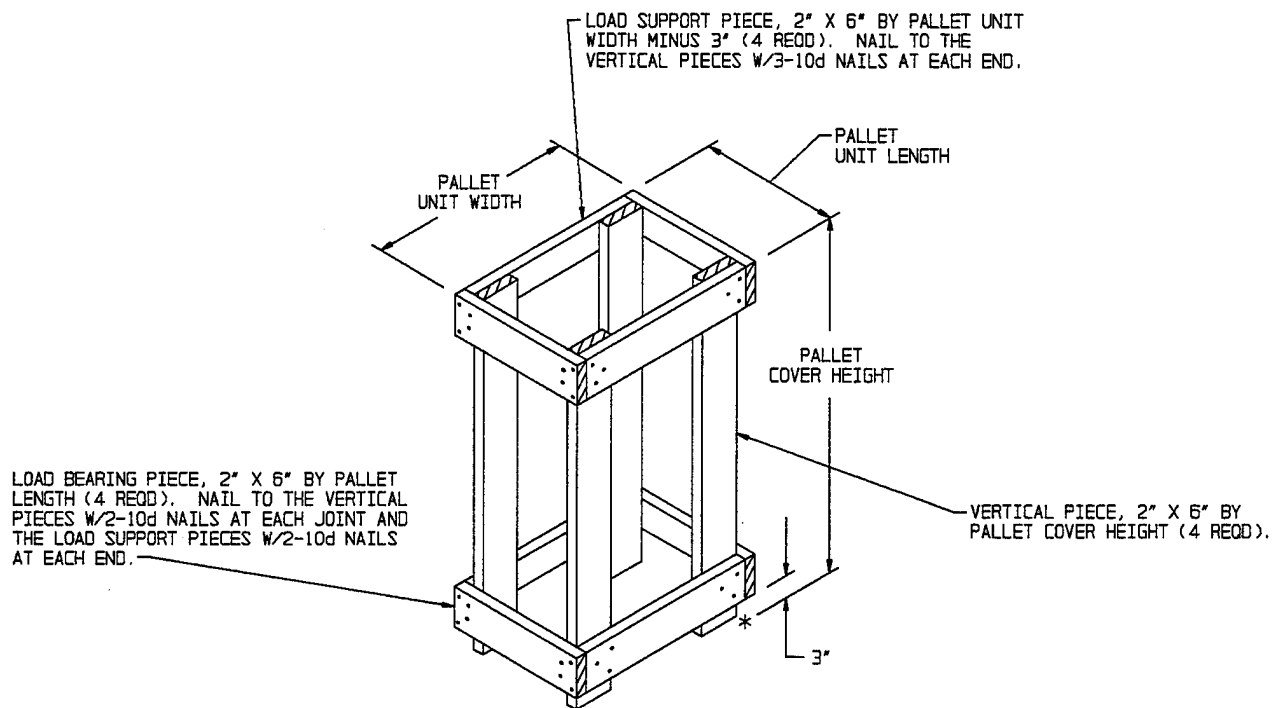


END VIEW

HOLD-DOWN STRAP THREADING DETAIL

FOR THE M1077 FLATRACK

THREAD A 24" LENGTH OF 2" STEEL STRAPPING THROUGH THE STAKE POCKET TO PROVIDE A PAD AT SHARP EDGE OF STAKE HOLDING TAB. THREAD ONE END OF THE 2" STEEL HOLD-DOWN STRAPPING UP THROUGH THE STAKE POCKET AND BRING THE LONG END UP OVER THE LOAD. ASSURE THAT THE 2" HOLD-DOWN STRAP IS CENTERED ON THE 2" STRAPPING PAD AND THE STAKE POCKET. SLIDE ONE 2" STRAP SEAL DOWN OVER END OF STRAP PAD AS SHOWN AND CRIMP SEAL WITH ONE CRIMP. SLIDE ANOTHER 2" STRAP SEAL DOWN OVER SHORT END OF HOLD-DOWN STRAP AND DOUBLE CRIMP EACH SEAL. THIS METHOD MAY ONLY BE USED ON THE M1077 FLATRACK STAKE POCKETS DUE TO THE TRIANGULAR SHAPE OF THE MI FLATRACK STAKE POCKETS.



OMITTED SLP PALLET UNIT ASSEMBLY

ONE OMITTED PALLETIZED UNIT ASSEMBLY IS REQUIRED FOR EACH OMITTED PALLET UNIT OF SEPARATE LOADING PROJECTILES WITHIN THE LOAD.